Welcome to Transplant Education Day

August 21, 2024

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Morning Session 10:30 AM – 12:00 PM

- *Skin Cancer Risk in Solid Organ Transplant Patients* with Puneet S Jolly, MD, PhD- UNC Dermatology

- *My Transplant Story* with Xavien Harrison, UNC Heart & Kidney Transplant Recipient

- *Ways to Get Involved!* With Lily Whitton, LCSW, CCTSW, CCSW-MCS, UNC Transplant

Solid Organ Transplantation and Skin Cancer

Puneet Singh Jolly, MD PhD
Professor of Dermatology
University of North Carolina
Lineberger Cancer Center

Learning Objectives

- Recognize the risk factors which cause skin cancer
- Understand potential treatment options in these patients
- Modify factors that help reduce skin cancer risk

Skin Cancers in the US

Incidence

100K/year

Melanoma

3-4 million/year

BCC

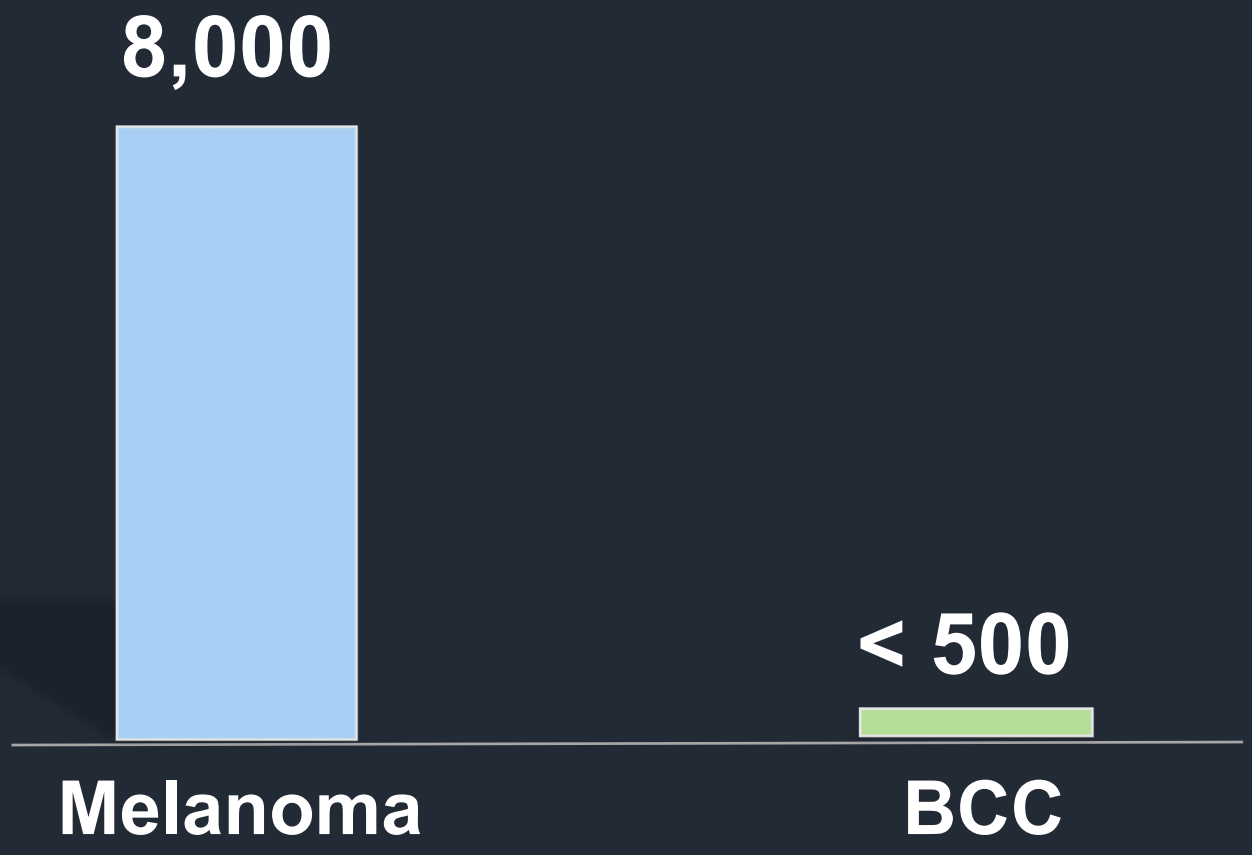
1 million/year

SCC

Sources: American Cancer Society and Skin Cancer Foundation

Skin Cancer Mortality

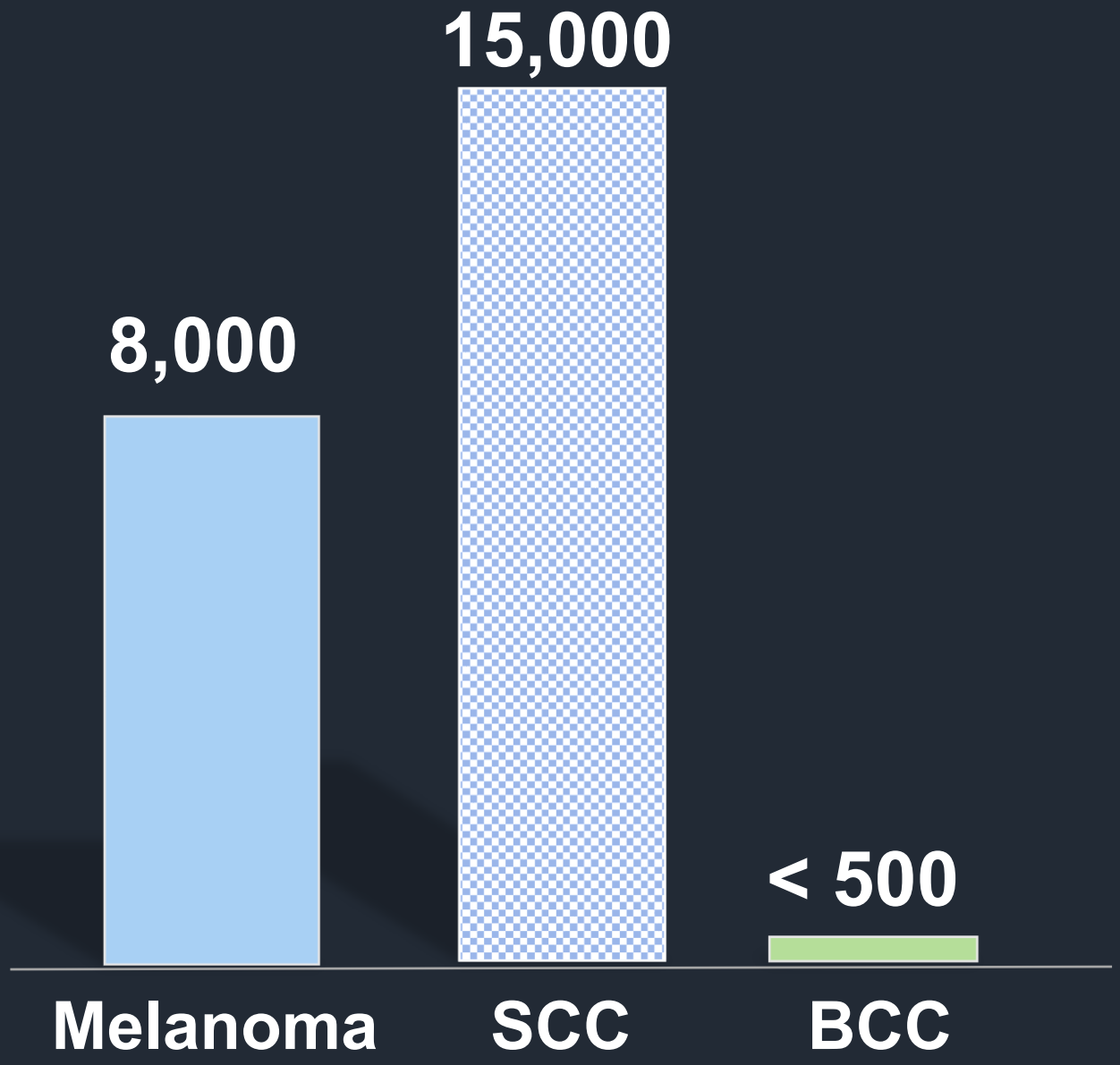
Melanoma Awareness Ribbon



Sources: American Cancer Society and Skin Cancer Foundation

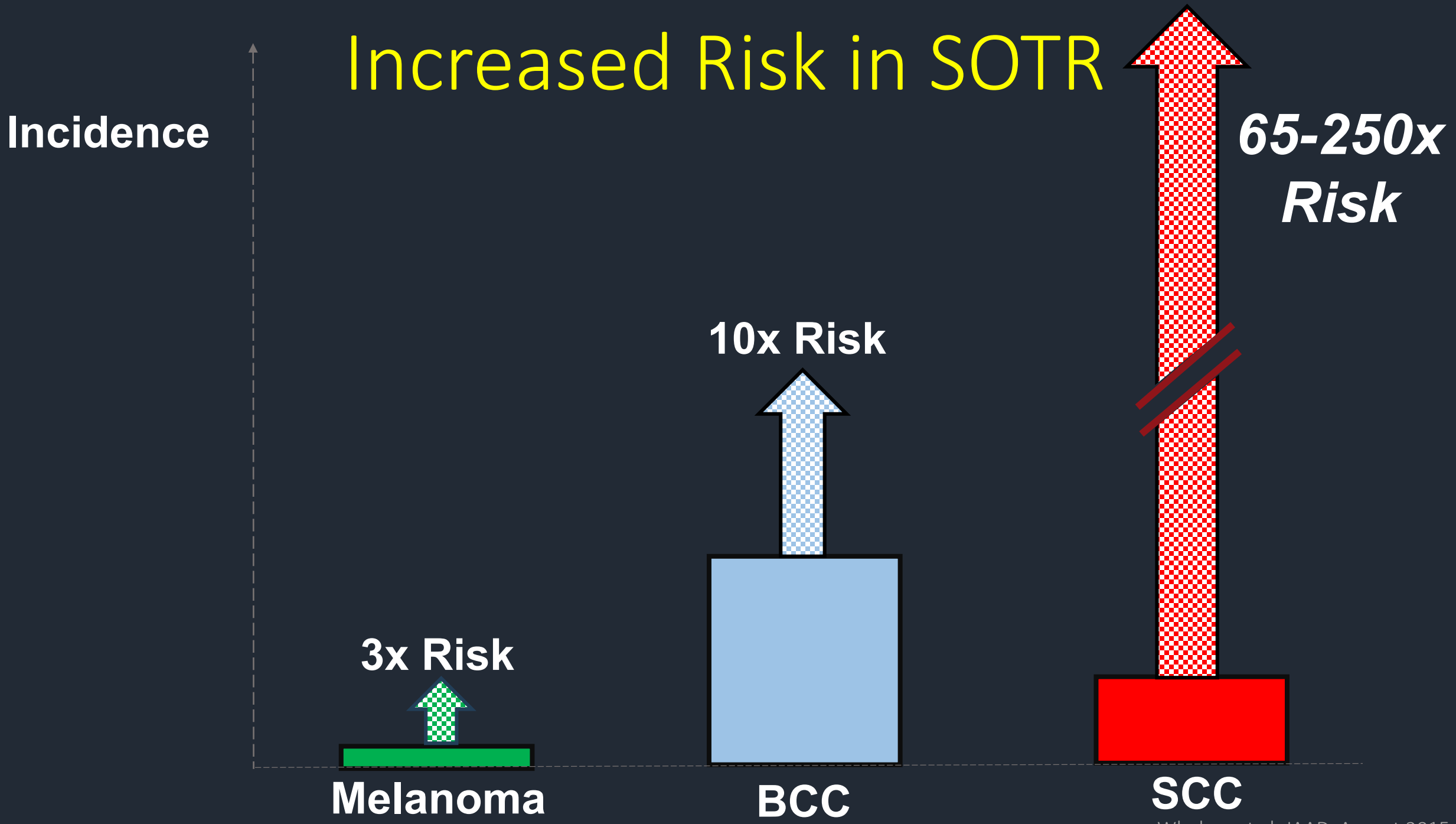
Skin Cancer Mortality

Melanoma Awareness Ribbon



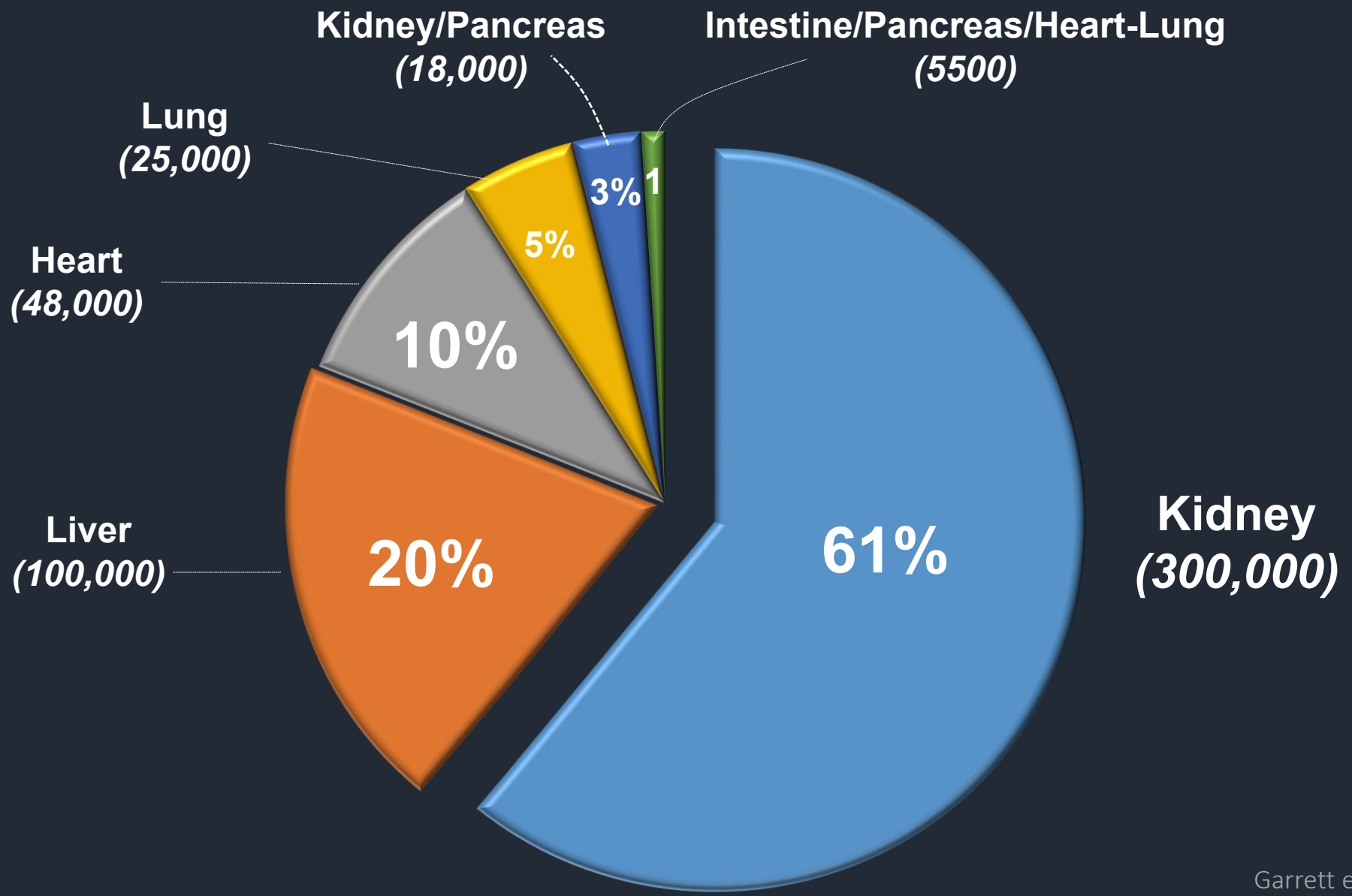
Sources: American Cancer Society and Skin Cancer Foundation

Increased Risk in SOTR



Wheless et al. JAAD. August 2015

Solid Organ Transplantation in the US

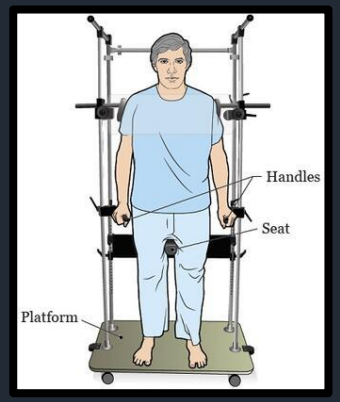


Garrett et al. JAAD. April 2016

History of Solid Organ Transplantation

1952
First Kidney Transplant

Early 60's
Total Body Irradiation



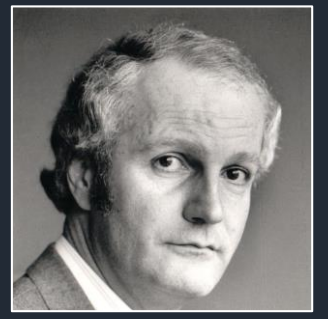
Mid 60s
6MP/ Imuran

George Hitchens/Gertrude Elion

Late 60's
Prednisone
Thomas Starzl

Early 1980s
Cyclosporine

Jean Borel



1990s
Tacrolimus

2000s
Sirolimus

Linden et al. Critical Care Clinics.. 2009

Skin Cancer Risk Factors

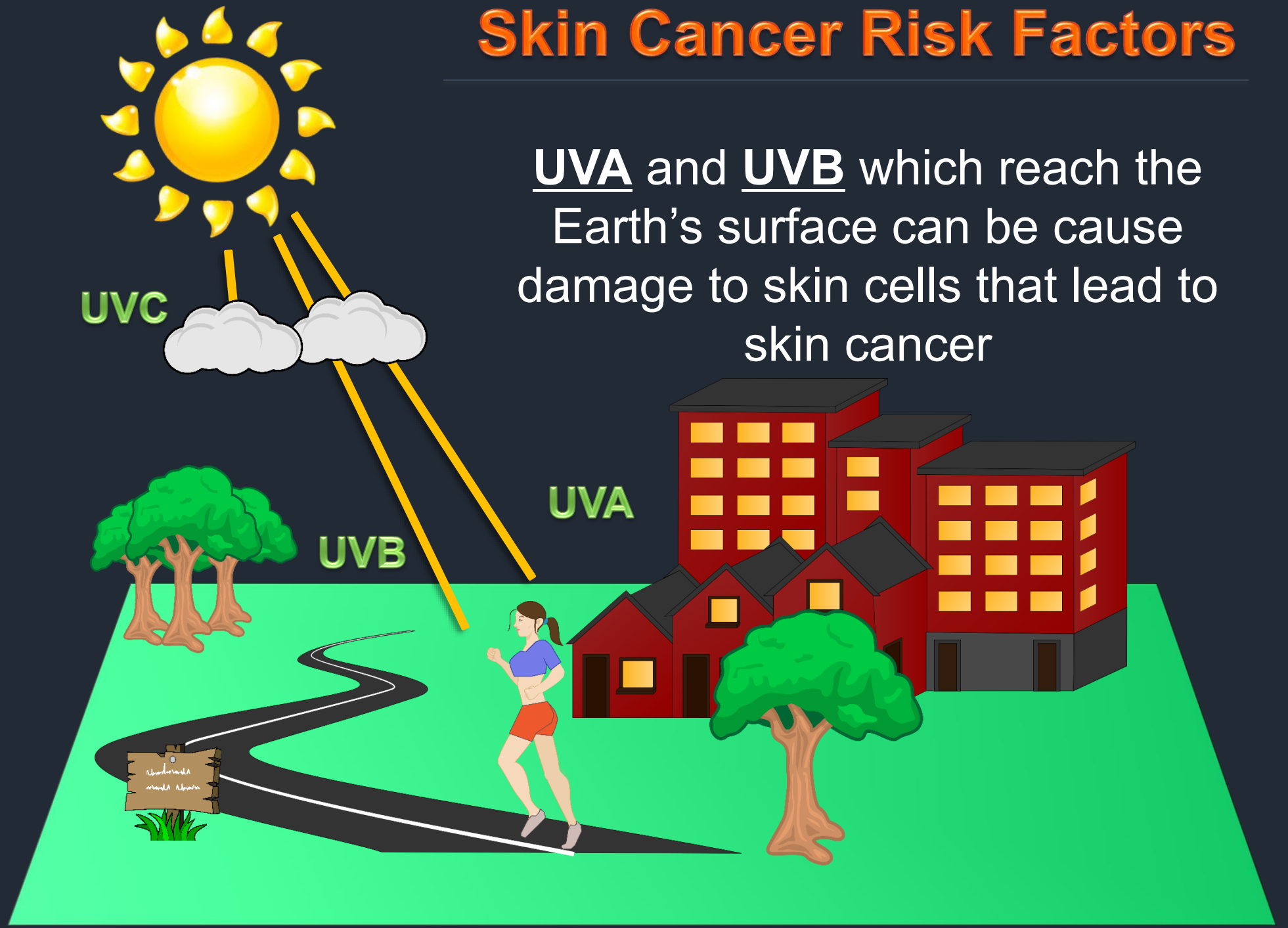
Gambichler et al. JEADV. 2006

-- UV-associated risk factors

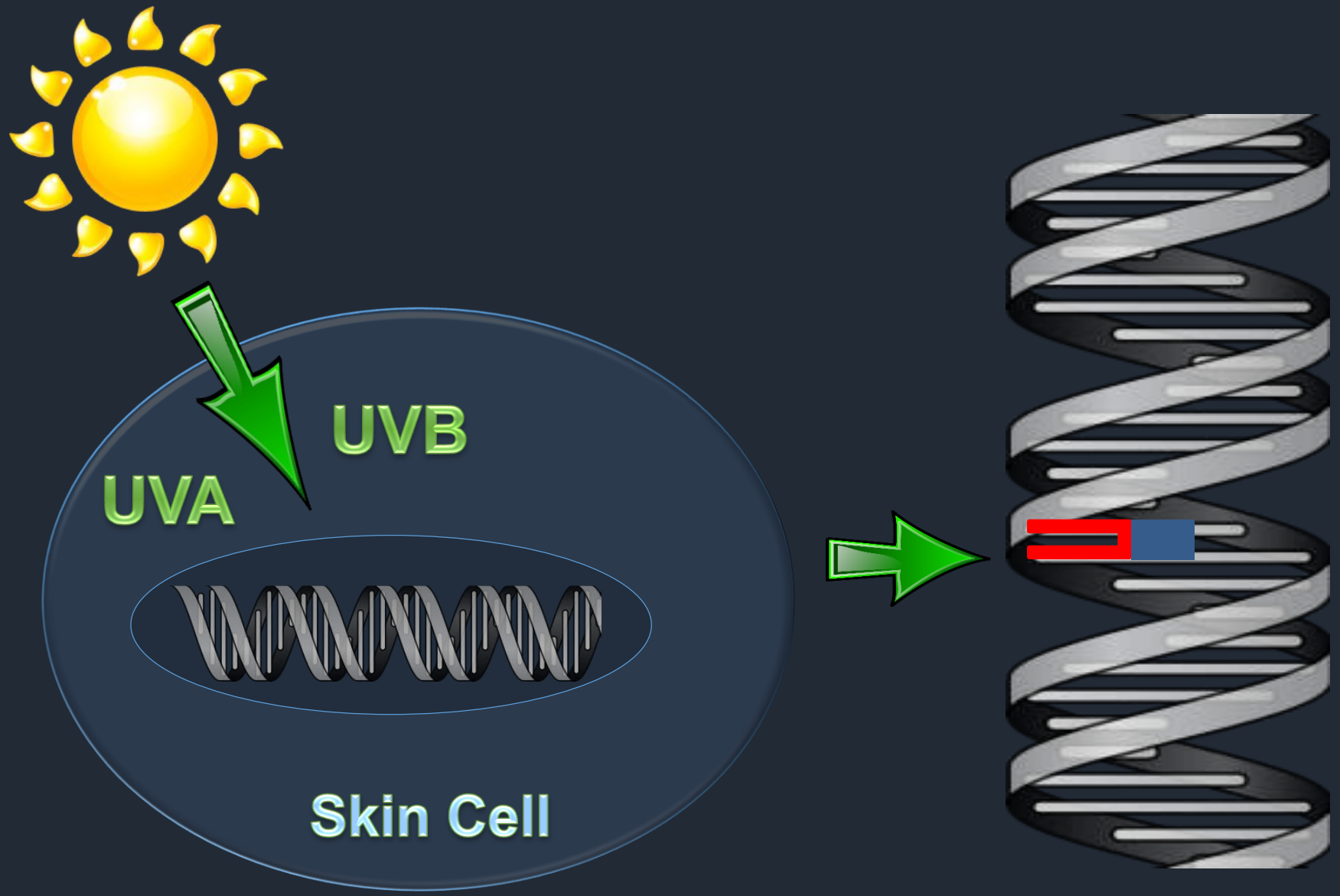
- Patients with fair skin, red hair, freckling - proclivity to sunburn
- Living closer to equator or at high altitudes
- Tanning Beds
- Immunosuppression
- Previous exposure to radiation
- Burn scars
- Genetics

Skin Cancer Risk Factors

UVA and **UVB** which reach the Earth's surface can be cause damage to skin cells that lead to skin cancer

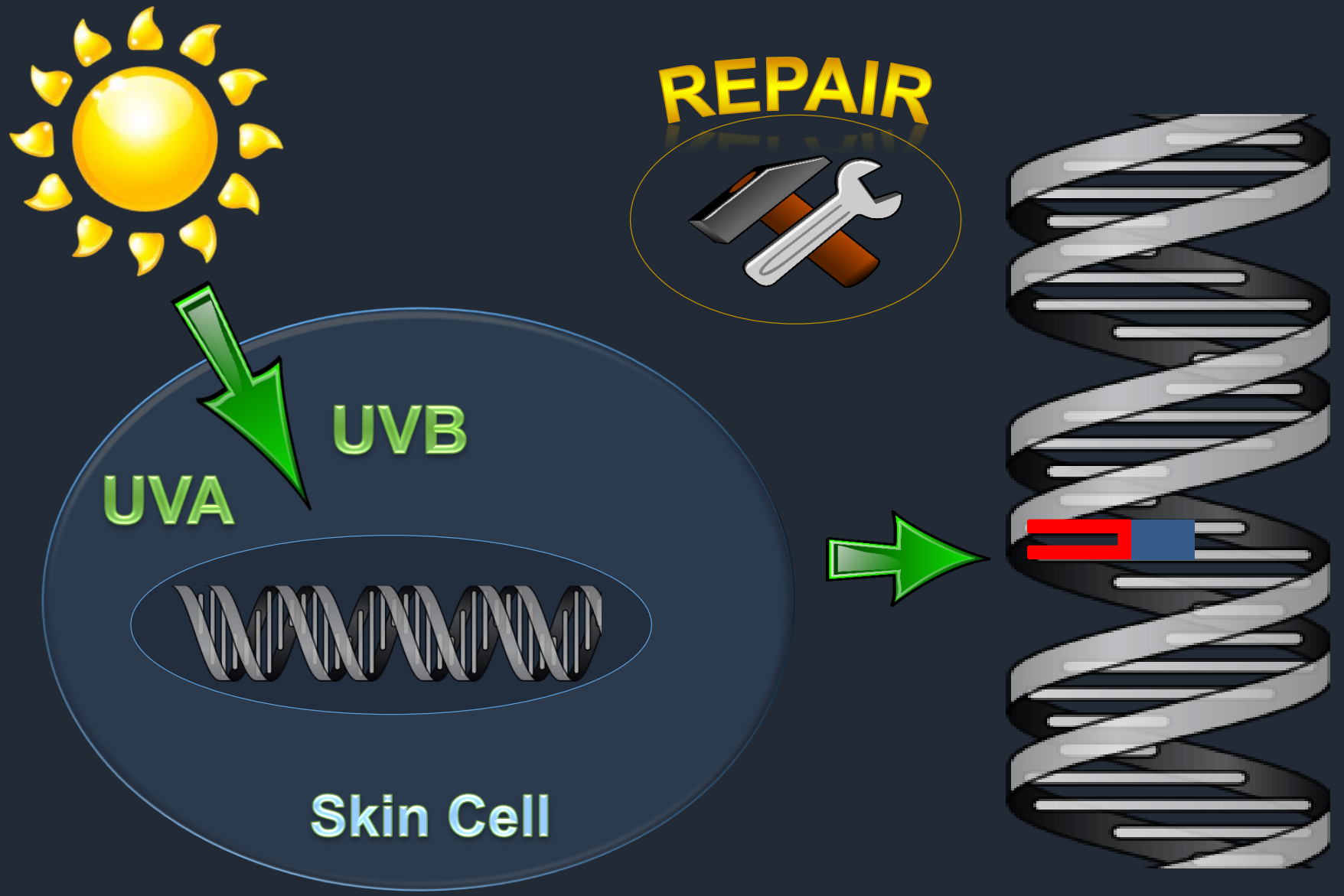


Sun Exposure and Skin Cancer

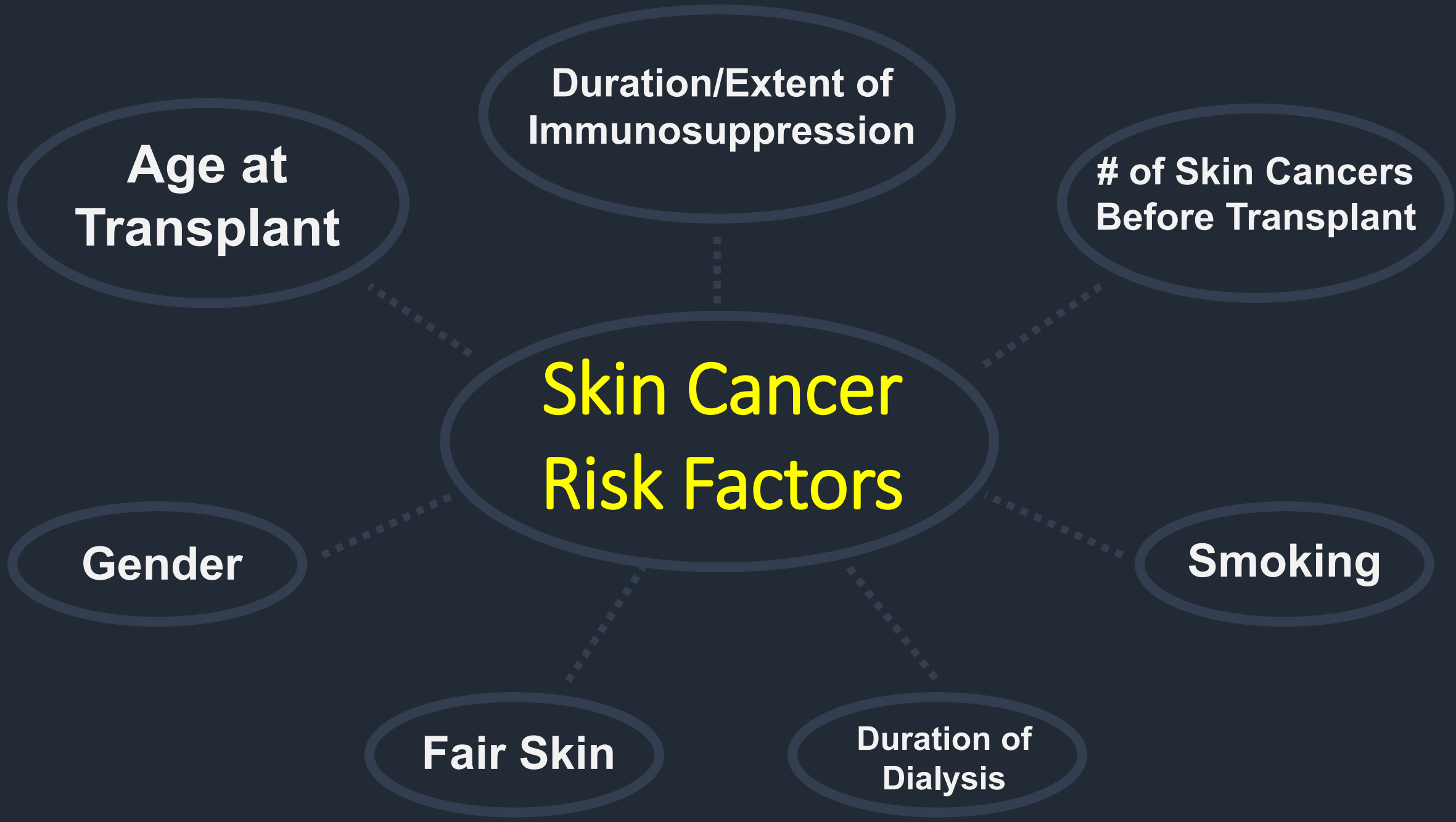


Walker, G. Future Oncology. 2008 (4) 6, 841-56

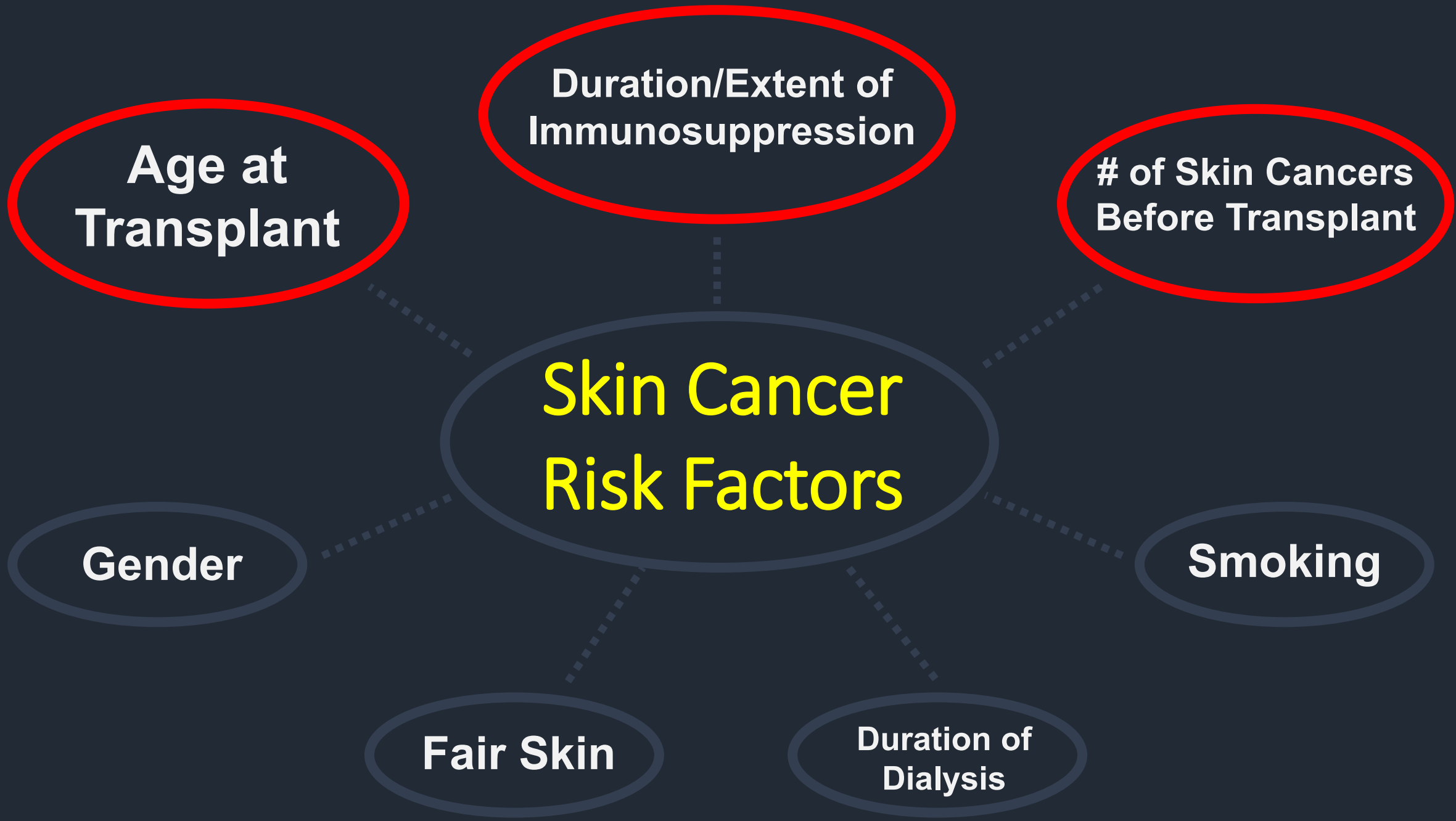
Sun Exposure and Skin Cancer



Walker, G. Future Oncology. 2008 (4) 6, 841-56



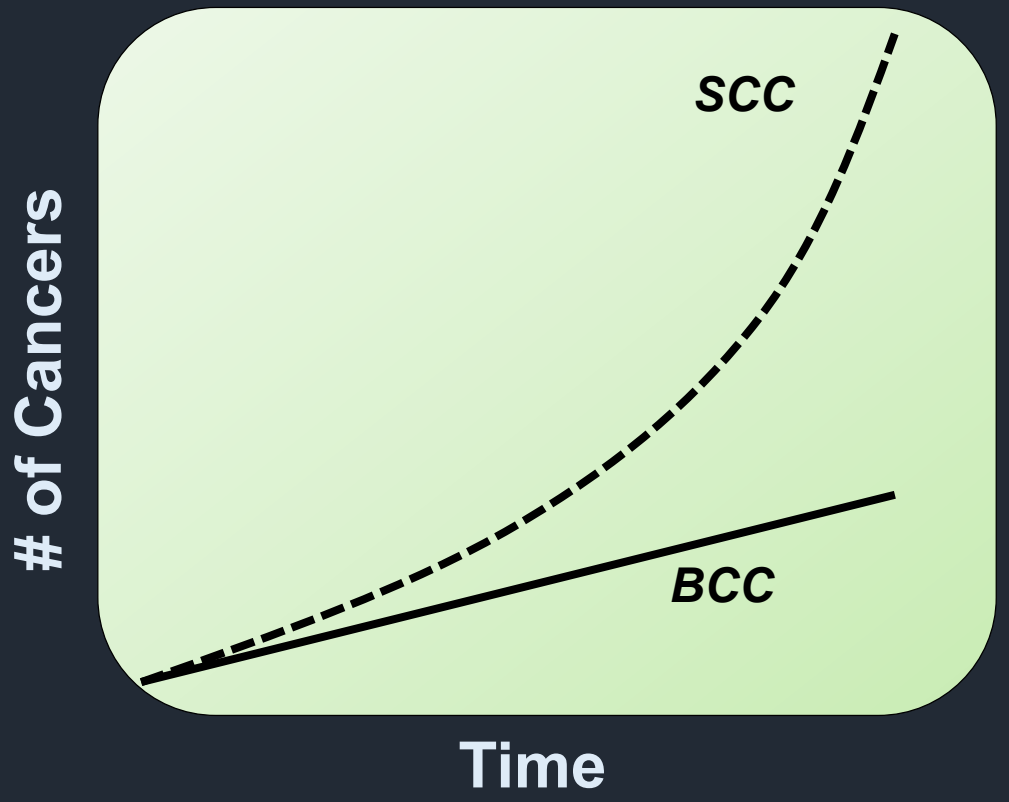
Zwald et al. JAAD. Aug 2011



Zwald et al. JAAD. Aug 2011

Important Factors Determining Skin Cancer Risk

Duration of Immunosuppression



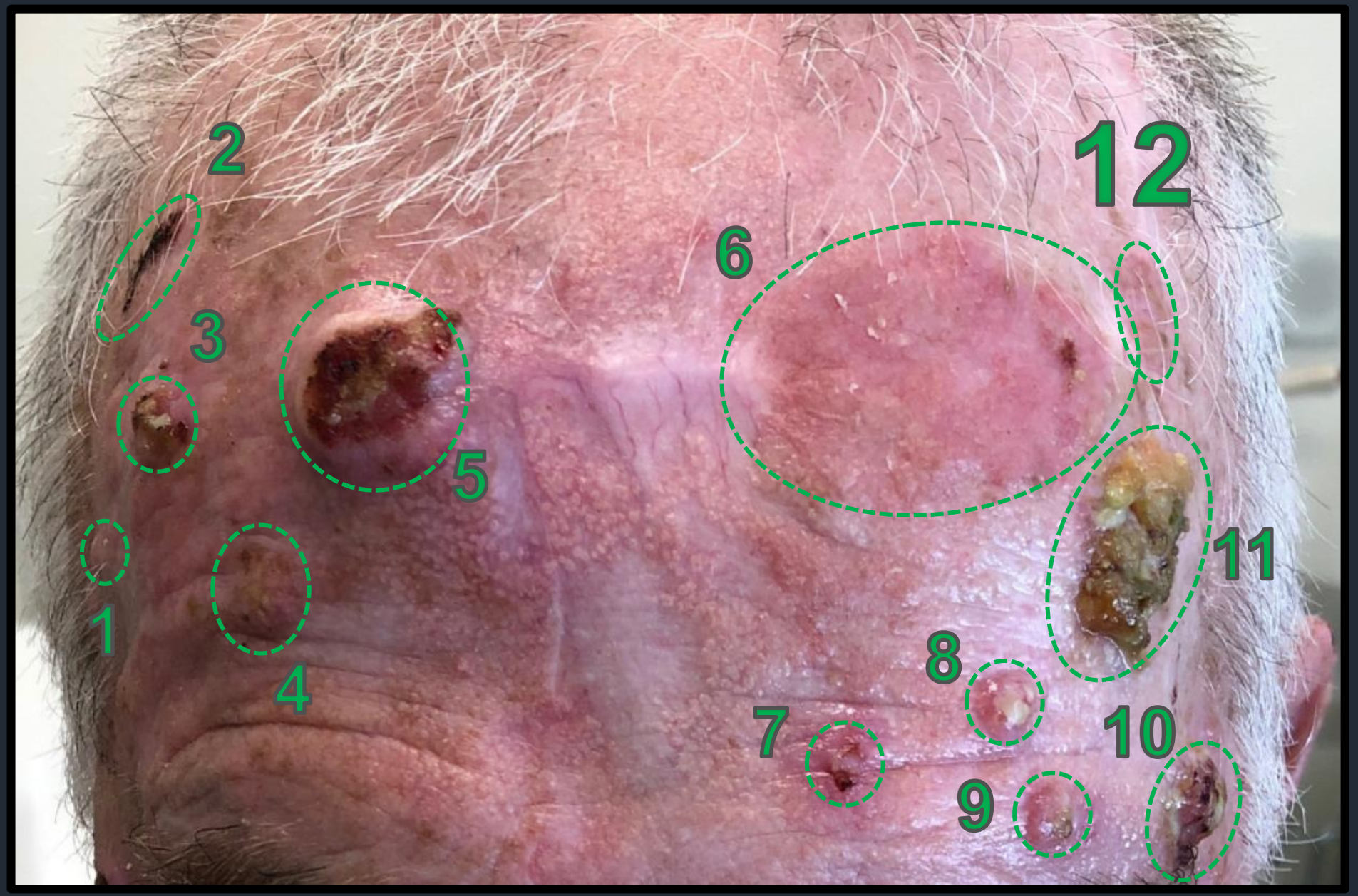
BCC:SCC is 4:1 in non-transplant but
1:4 in transplant patients

Zwald et al. JAAD. Aug 2011

2016

2021

2024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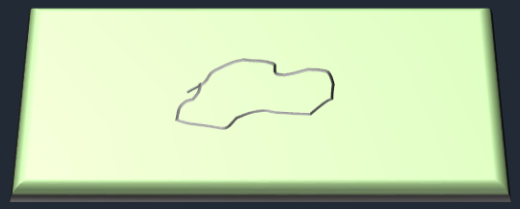
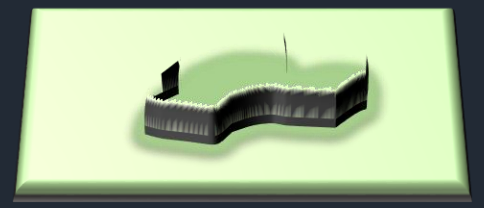
Treatment Options

Cryotherapy

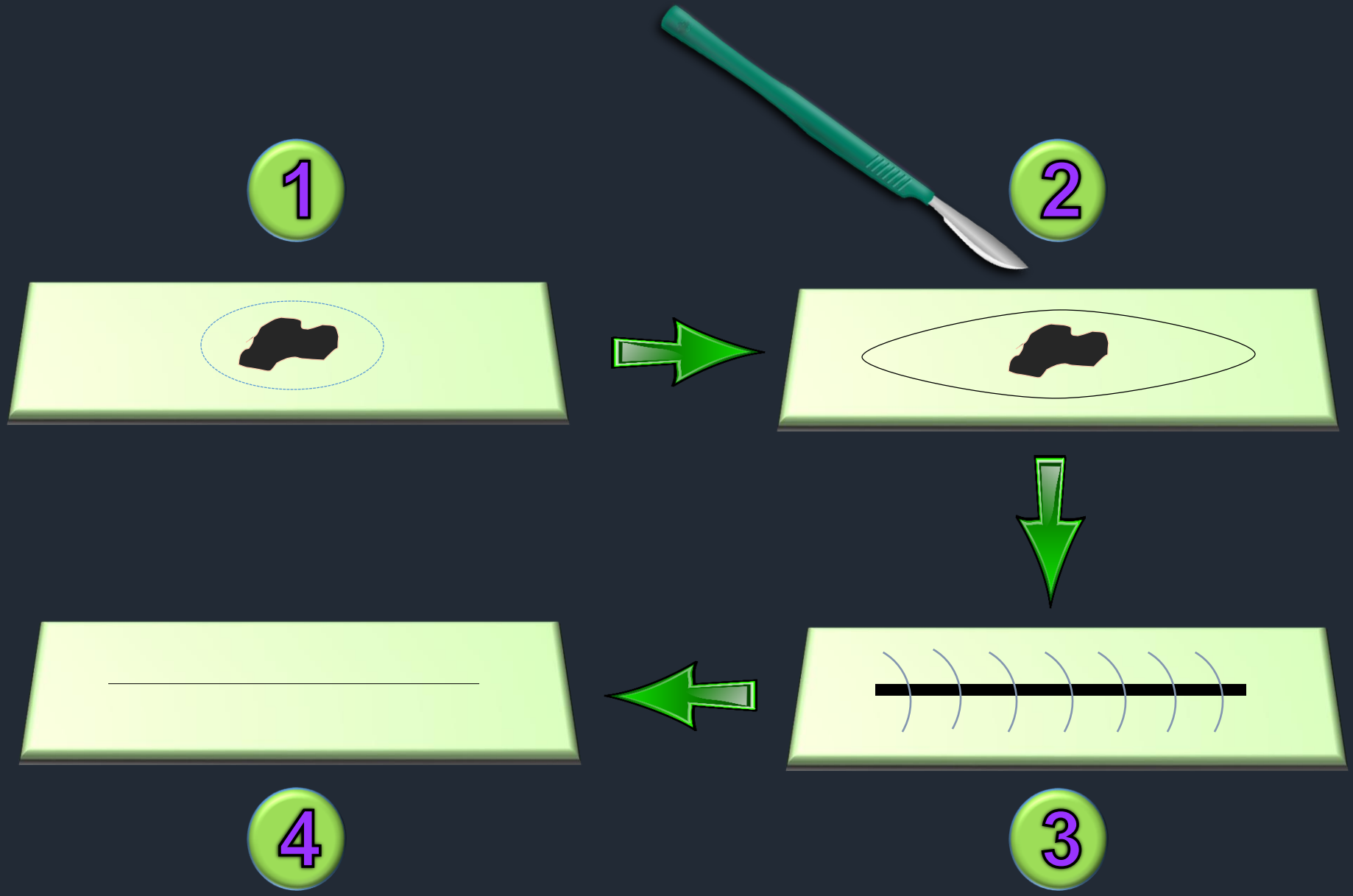
Topical



Surgery

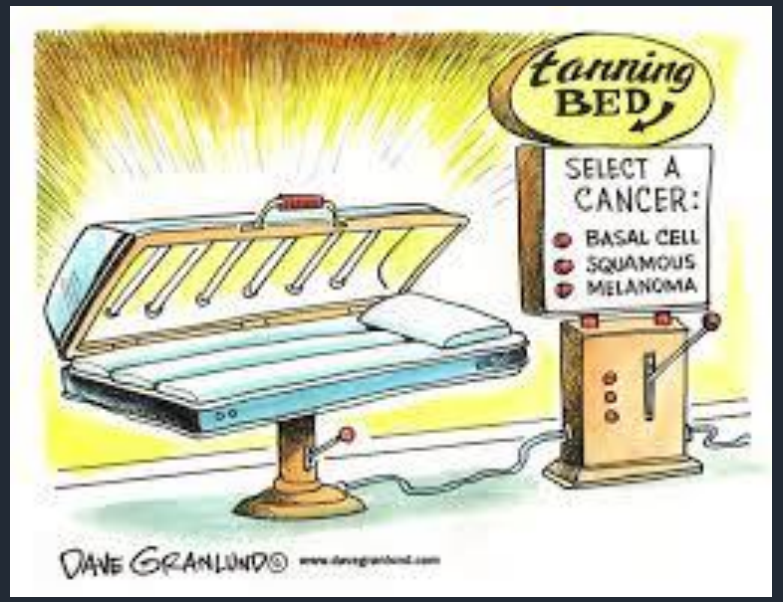


Skin Cancer Surgery



Melanoma and Artificial UV Exposure

97-99% UVA / 1-3% UVB



- Prior to ***1990***, melanoma in Iceland < other Nordic nations
- Slow increase and then in ***2000***, surpassed other Nordic countries
- Sharpest rise was among women *less than 50*.
- Trunk > limb in women
- Decline in incidence after 2000 – concerted effort to educate public

Autier et al. Curr Opin Oncol 23:189–196, 2011

Sun Protection

Sunscreen	Wide-brimmed hat	UV-protective clothing
		

Historical Perspective

- ***1938*** - Chemist Franz Greiter developed *Gletscher Crème* (SPF 2) after developing a sunburn while ascending the Alps

- ***1944*** – Pharmacist Benjamin Green developed *Red Vet Pet* for soldiers in WWII

- ***1950s*** - Coppertone acquired the patent, marketed a product containing cocoa butter and jasmine

- ***1980 – Coppertone developed first UVA/UVB sunscreen***

- ***1996 -*** The first standard for sun-protective clothing has been published by the Australian Standardization Institute.

Sun Protective Factor

Measure redness (almost only UVB)

Application of 2g/cm^2 – nearly twice as much as the average human being applies

New Sunscreen Label

FIGURE 1. New US Food and Drug Administration (FDA) labeling standards include separately delineating "broad-spectrum" and sun protection factor (SPF) information in an equal font size. The claim "water-resistant" must be specified with a time, ie, 40 or 80 minutes. The "drug facts" box on the back of the product must include usage directions, guidelines for sun protection, and other FDA-required statements.

(1)SPF and Broad Spectrum are same size font on bottle

(1)Water resistant (40/80 min)

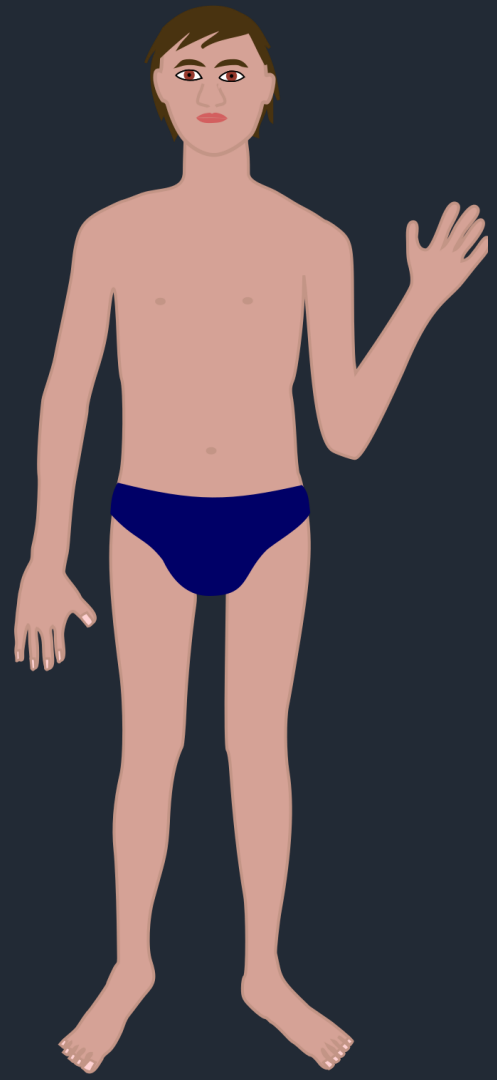
(2)Maximum, SPF >50

Jiu et al. Cleveland Clinc Journal of Medicine. Vol 79, 6. June 2012

Proper Application of Sunscreen

“Shot Glass Rule”

1-2 ounces applied every 2 hours for whole body



“Teaspoon Rule”

1 teaspoon for each “body segment”

- **face/neck**
- **each arm**
- **each leg**
- **back**
- **abdomen**
- **chest**

SPF vs UPF

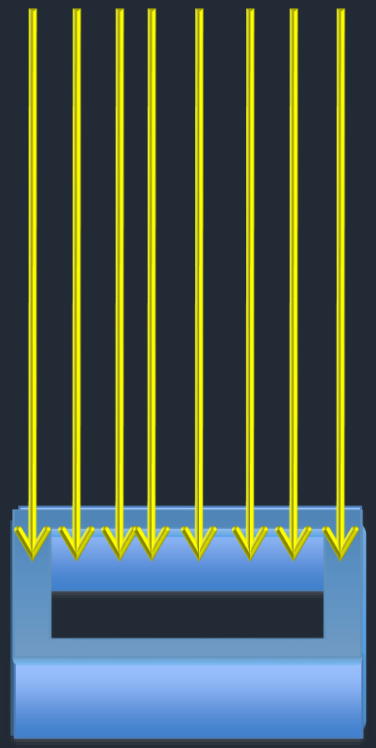
Whereas SPF measures only UVB, UV Protective Factor measures both UVA and UVB

1st set of standards were developed in Australia (1996)

International Society of Standards has worked on developing recommendations

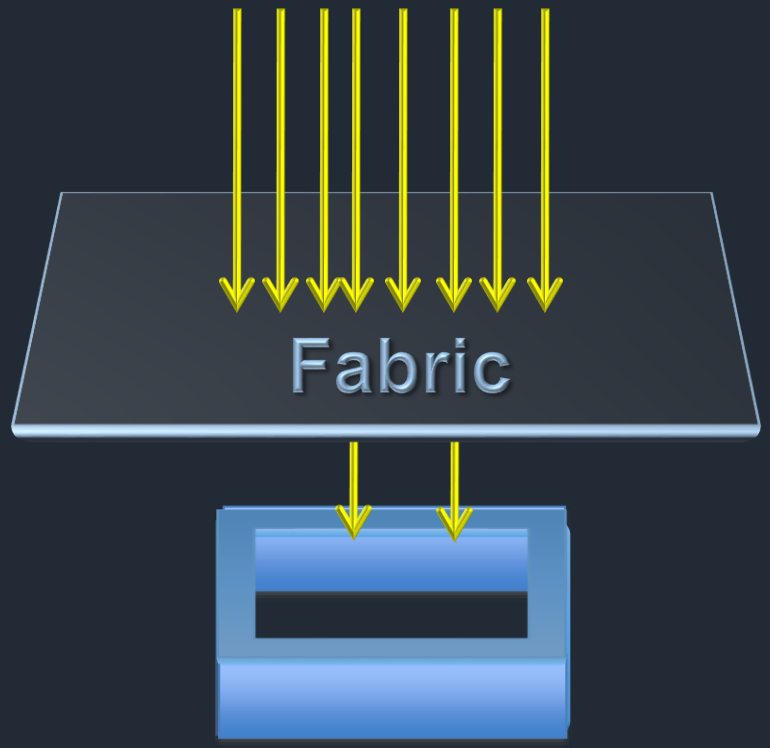
Test Methods

Broadband UV Source



Spectrophotometer

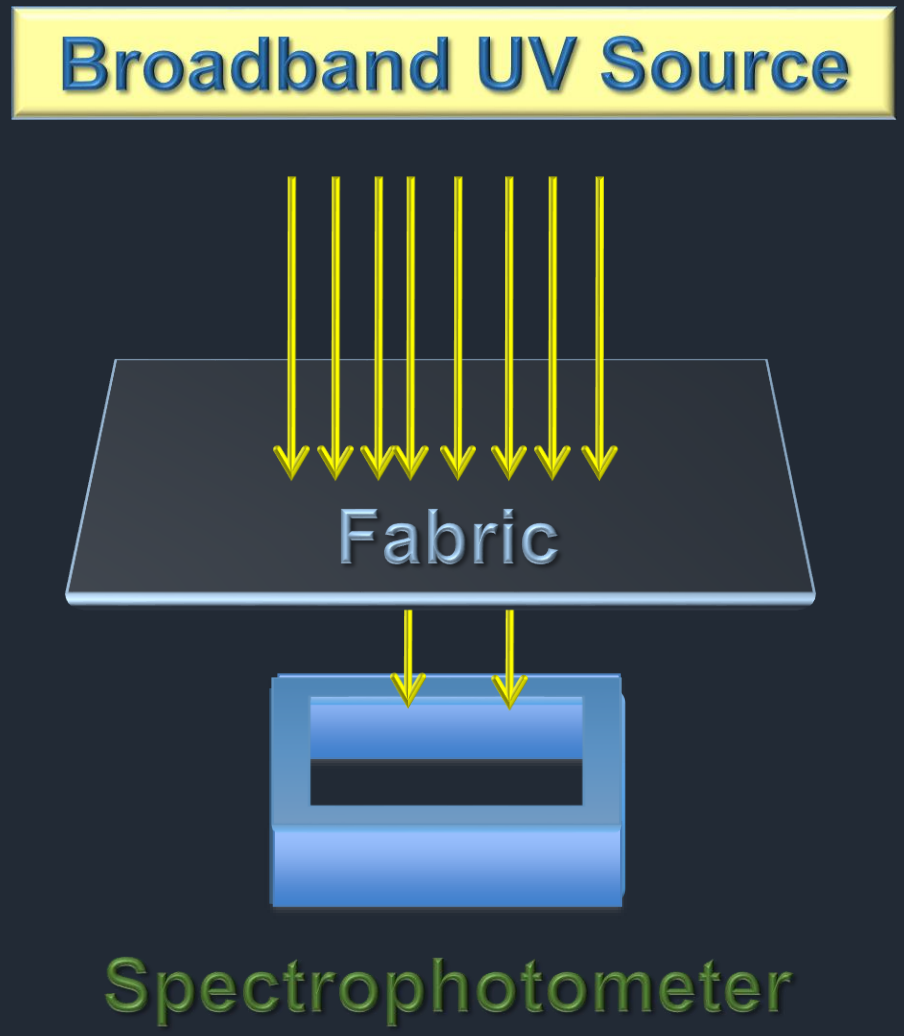
Broadband UV Source



Spectrophotometer

Hoffmann et al. Archives of Derm. 2001

Test Methods



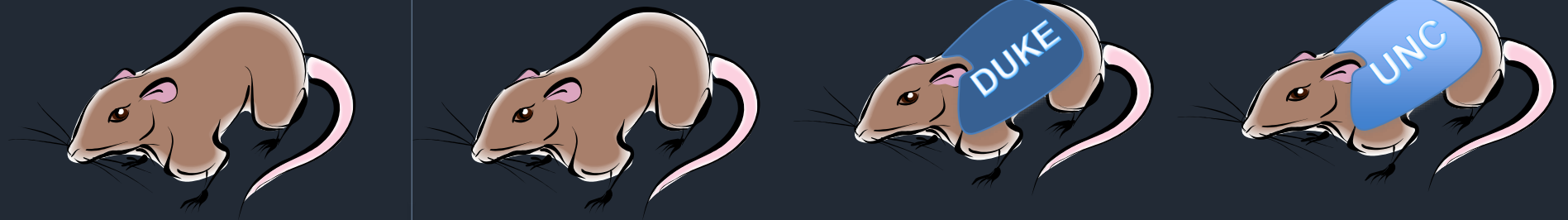
UVR : UVR

(- specimen) (+ specimen)

Fabric rated *UPF 30* means that if ***30 units*** of UV fall on the fabric only ***1 unit*** will pass through. A UPF 30 fabric that blocks or absorbs 29 out of 30 units of UV is therefore blocking 96.7% UV.

Hoffmann et al. Archives of Derm. 2001

Sun Protective Fabric



Control	No Fabric	Typical Fabric	Special Fabric
No Tumor	Tumor	Tumor	No Tumor

Menter et al. JAAD. 1994

UPF Rating System

UPF Rating	Protection Category	% UVR Blocked
15-24	Good	93.3-95.9
25-39	Very Good	96-97.4
40+	Excellent	97.5 or more

Hoffmann et al. Archives of Derm. 2001

Textile Qualities

Material

- UPF of cotton, viscose, rayon and linen is usually less than nylon, wool, silk and polyester (usually highest)
- Bleached fabric has less UPF than equivalent non-bleached fabric.

Thickness

- The tighter the weave of the fabric, the greater the UPF
- UPF also increases with increasing fabric weight and thickness

Color

- Darker colors provide better UPF due to greater UV absorption
- Can add UV absorbers/reflectors to fabrics (detergent).

Wear and Tear

Stretch

- Stretching increases porosity which diminishes a fabric's UPF
- Typically > 15% stretch is associated with a decreased UPF

Wetness

- Mostly applies to cotton fabrics
- Wetness reduces UV scatter and increases transmission through fabric

Laundering

- Less clear but may increase UPF b/c over time, decrease space between fibers

UVSKINZ

Coolibar®
Quality Sun Protection

SOLUMBRA

REI
Get outside yourself.℠

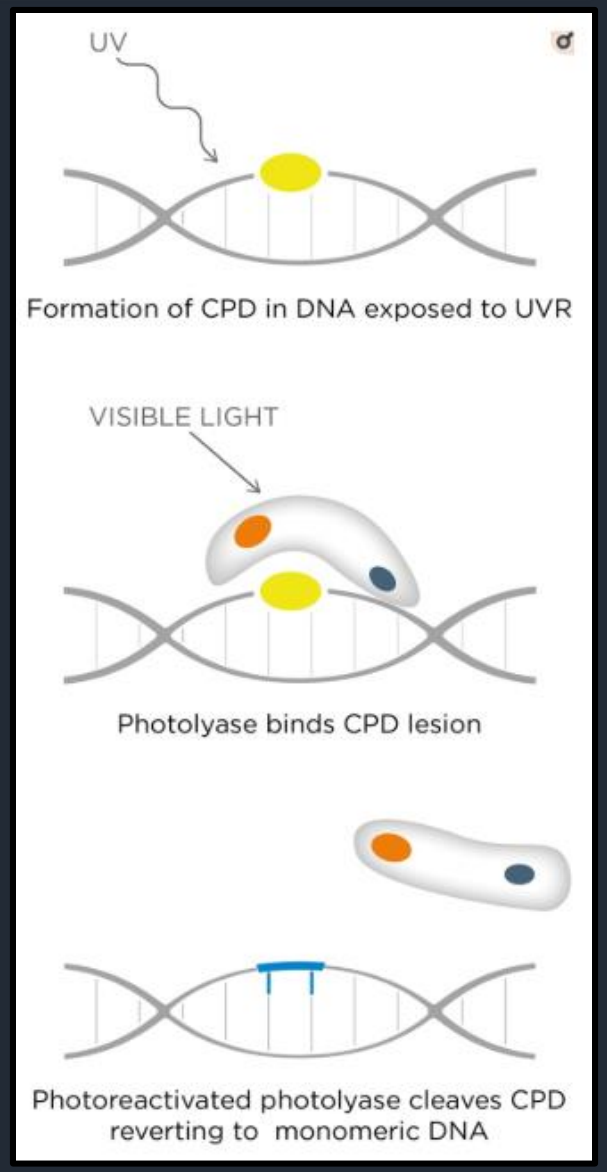
Nobel Prize in Chemistry – Aziz Sancar

Photolyase and DNA Repair

Photolyase isolated from the cyanobacterium *Anacystis nidulans* is specific for CPD photoproducts; this phytolyase breaks CPDs and restores the original monomeric state

NER is more effective in recognizing and repairing pyrimidine **pyrimidones** and relatively inefficient in repairing **CPDs**

Photolyase efficiently binds to CPDs and is activated by **visible light** to cleave CPD from DNA



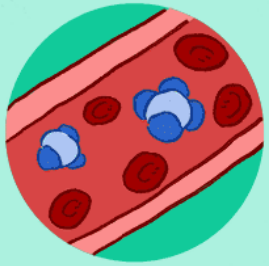
Tan et al. Nature Communications. June 2015

What Conditions Can Niacinamide Help?

Hyperpigmentation and melasma

Pellagra

Osteoarthritis



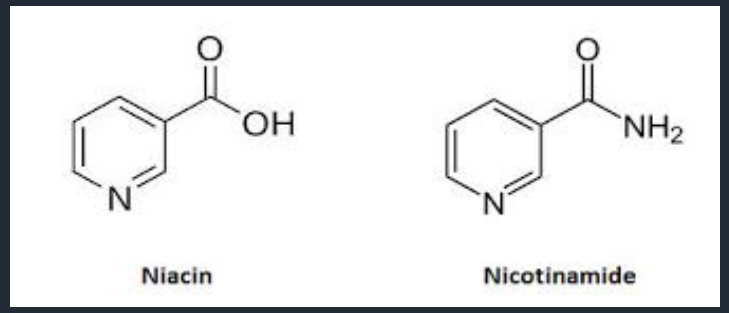
Hyperphosphatemia (reduces phosphate in blood)

Skin cancer

Acne

Early stages of type 1 diabetes

Niacinamide for Prevention



- ***Niacinamide* (*aka Nicotinamide***) is the amide form of Niacin (Nicotinic Acid, B3)

- Precursor to NADH/NADPH used as coenzymes in cell respiration and Poly-ADP Ribose Polymeration (detects DNA damage)
- Inhibits **CPD** and **8oxoG** formation

- Mean # of NMSCs – ***1.8 (Nicotinamide) vs 2.4 (Placebo) ~ 23% reduction***
- BCCs – 1.3 (NA) vs 1.7 (Placebo)
- SCCs - 0.5 (NA) vs 0.7 (Placebo)

- Protective effect not maintained at 6 months

Mainville et al. J Cutan Med Surg. May 2022

Polypodium leucotomos

- Polypodium leucotomos extract (Fernblock)
- Enhances endogenous antioxidant system (effectively neutralizes superoxide)

- Anti-inflammatory – *reduces TNF-alpha (AP1/NF-κb)*

- Reduces ***CPD*** and ***8oxoG***

- Prevents <u>trans->cis urocanic acid isomerization</u>

Nestor et al. J of Clin and Med Aesthetic Derm. Feb 2015

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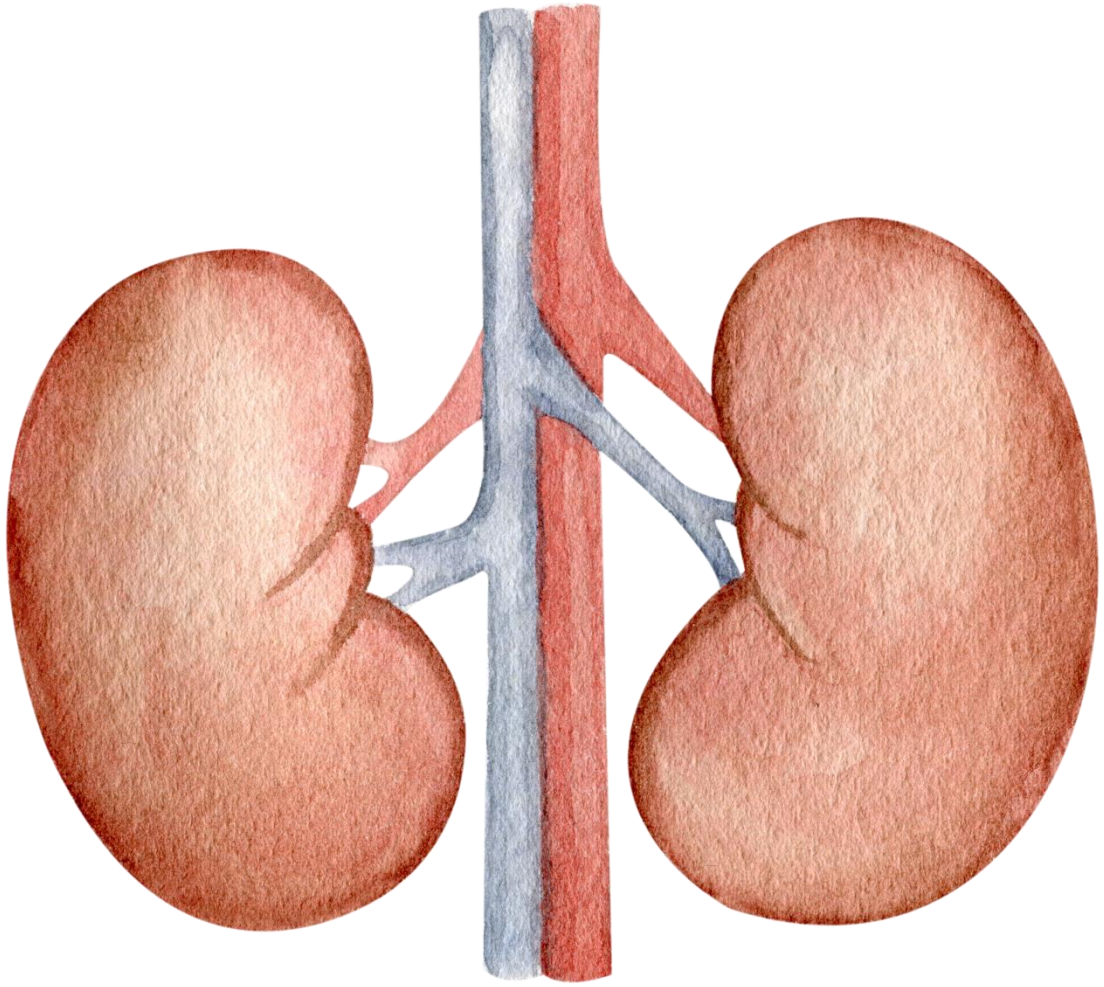
Thank you for your attention!

Did You Know?

UNC Center for Transplant Care performed 154 kidney transplants in 2023! That ties 2020 for the most kidney transplants in a year.

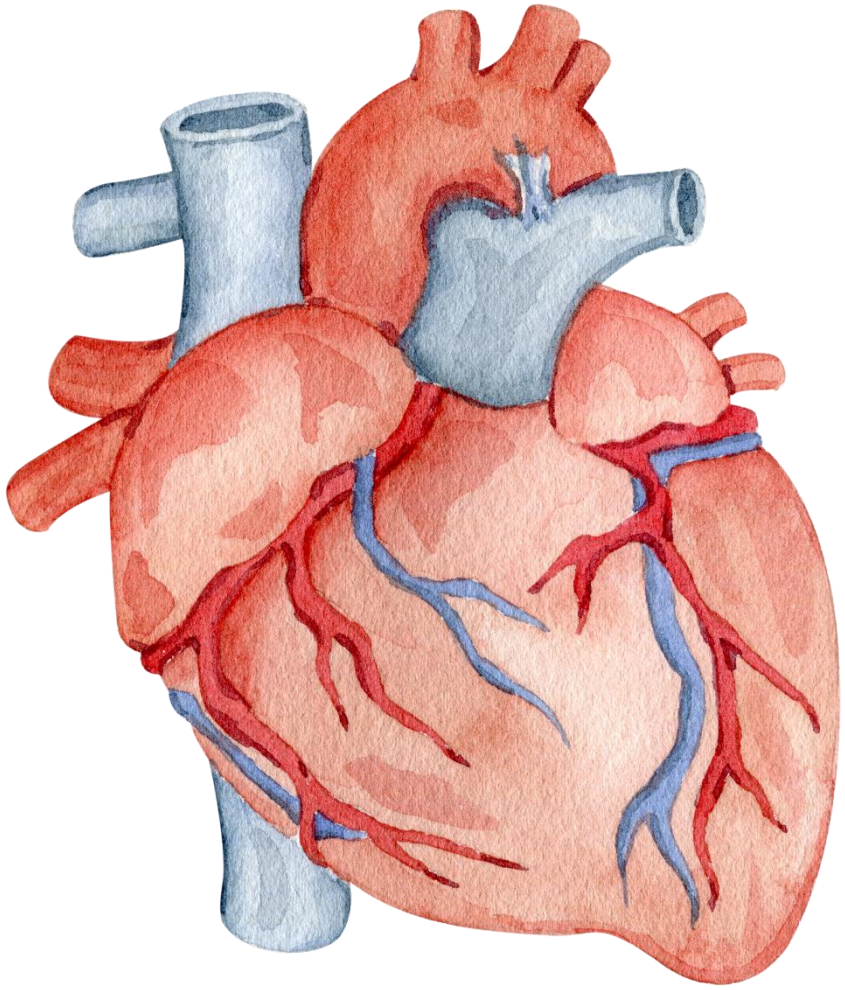


My Transplant Story

with Xavien Harrison, UNC Heart & Kidney Transplant Recipient

Did You Know?

UNC Center for Transplant Care performed 13 Heart Transplants in 2023 and implanted 48 Left Ventricular Assist Devices (LVADs).



Ways To Get Involved!

Staying Engaged after Transplant

UNC HEALTH℠

Gratitude

Communication with Your Donor Family

- **It's always nice to say thank you!**
- **You can write to your donor family.**
- **Your donor family can write to you.**
- **Communication must be anonymous at first, through HonorBridge.**
  - HonorBridge has tips for how to write. Visit their table!
  - If you and your donor family both want direct contact, HonorBridge can help.

HONORBRIDGE

DONATE LIFE

Policy Wonks Needed!

Organ Procurement & Transplantation Network

What is the OPTN?

- Public/private partnership
- Goal: Improve the U.S. system so that more life-saving organs are available for transplant
- Makes rules about operations and professional membership
- Links all US professionals involved in transplantation and donation
- Solicits public comment about issues of concern to the transplant community
- Has over 300 volunteers

OPTN Organ Procurement & Transplantation Network

HRSA Health Resources & Services Administration

Organ Procurement & Transplantation Network

How to get involved:

- **Attend Regional 11 Meetings, held twice a year**
  - In person, in Charlotte, NC for our Region 11
  - Virtually
- **Submit public comment on policy and bylaws proposals**
  - Feedback is sought at least twice a year.
  - Comment is considered prior to adoption of changes.
- **Join a committee**
  - Help shape OPTN policies in the continuous process of improving the nation’s transplant system.
  - Three-year commitment with a minimum of two to four hours of meetings each month.
  - Travel to two in-person meetings per year is required (expenses reimbursed).

Community and Service

Transplant Games of America

TRANSPLANT GAMES of AMERICA

- Games are held every 2 years
- July 5-10, Birmingham, AL
- Inspiring events:
  - Opening ceremony
  - Quarter Century Club Dinner
  - Donor Tribute
- Workshops
- Competitions!

Transplant Games of America

Transplant Games of America - July 2024

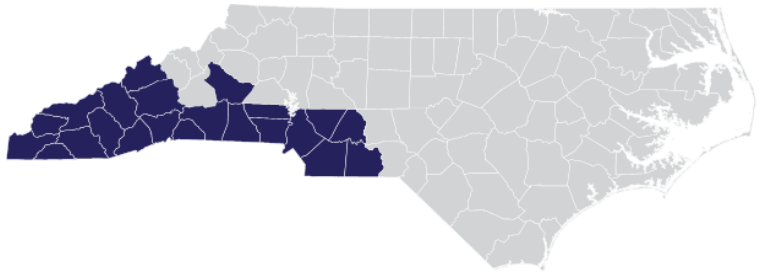
Kayla Sanders, UNC double lung transplant recipient, 12/11/2013

Medals:

- Bronze in the 60m dash
- Bronze in 4x100m relay
- Silver in Team Basketball
- Gold in Women's Pickleball
- Gold in Mixed Pickleball

Champions for Life

- **Transplant Ambassadors**: Help with public engagements, including tabling events and presentations.
- **DMV Ambassadors**: Visit assigned DMV stations a few times a year to encourage and thank examiners for the job that they do.
- **Educators**: Visit high schools and driver's education classes to teach students about what saying "yes" at the DMV means and just how important it is.



Hospital Volunteer Opportunities

Hospital Volunteer Opportunities

- The mission of the Volunteer Services Department (https://www.uncmedicalcenter.org/uncmc/support/volunteer-services/) is to assist UNC Health in its goals to provide comprehensive health care to the communities we serve and give a meaningful outlet for the human need to be of service to others.

- Our service areas include UNC Medical Center in Chapel Hill, Hillsborough Campus, and surrounding clinics.

- Community Members (18 years or older and not enrolled in a high school or undergraduate program), please visit our Chapel Hill Medical Center – Community Volunteer (https://www.uncmedicalcenter.org/uncmc/support/volunteer-services/uncmc-volunteers/)
and Hillsborough (https://www.uncmedicalcenter.org/uncmc/support/volunteer-services/hillsborough-hospital-volunteers/) pages for application and onboarding details.

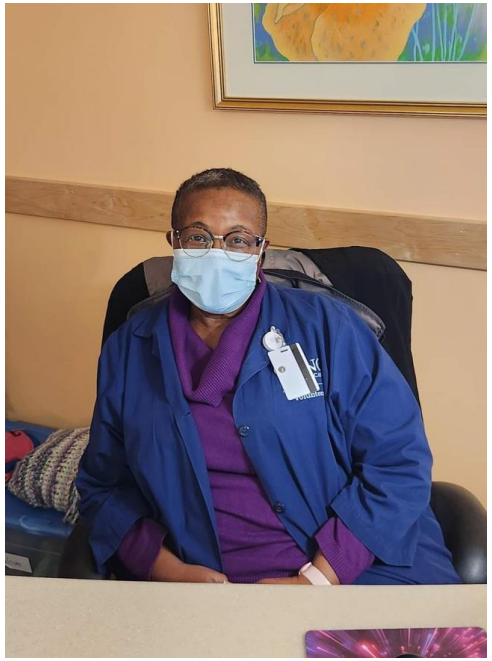
Hospital Volunteer Opportunities

- **Carolina Conexiones** is made up of a group of bilingual volunteers (English and Spanish) that support Limited English Proficiency (LEP) patients and their families. Spanish fluency is required. https://www.uncmedicalcenter.org/uncmc/support/volunteer-services/opportunities/carolina-conexiones/

- **Tar Heal Paws** is an animal therapy program at UNC Health that offers support and companionship to patients, visitors, and staff. Its purpose is to reduce stress and provide interaction with animals during hospitalization and medical intervention. https://www.uncmedicalcenter.org/uncmc/support/volunteer-services/opportunities/tar-heal-paws/

- **Patient and Family Advisors** improve the care experience by helping us better understand the patient and family point of view. Advisors represent the voice of the patient. They serve as a resource on committees, short term projects and evaluation of programs, policies, and services.

There’s a volunteer activity for everyone!



volsvcs@unchealth.unc.edu

LUNCH 12:00 – 1:00PM

Afternoon Session 10:30 AM – 12:00 PM

- *Now What Do I Eat? Nutrition for Life After Transplant* with Jodi Mettel, MS, RD, LDN, CCTD, UNC Transplant

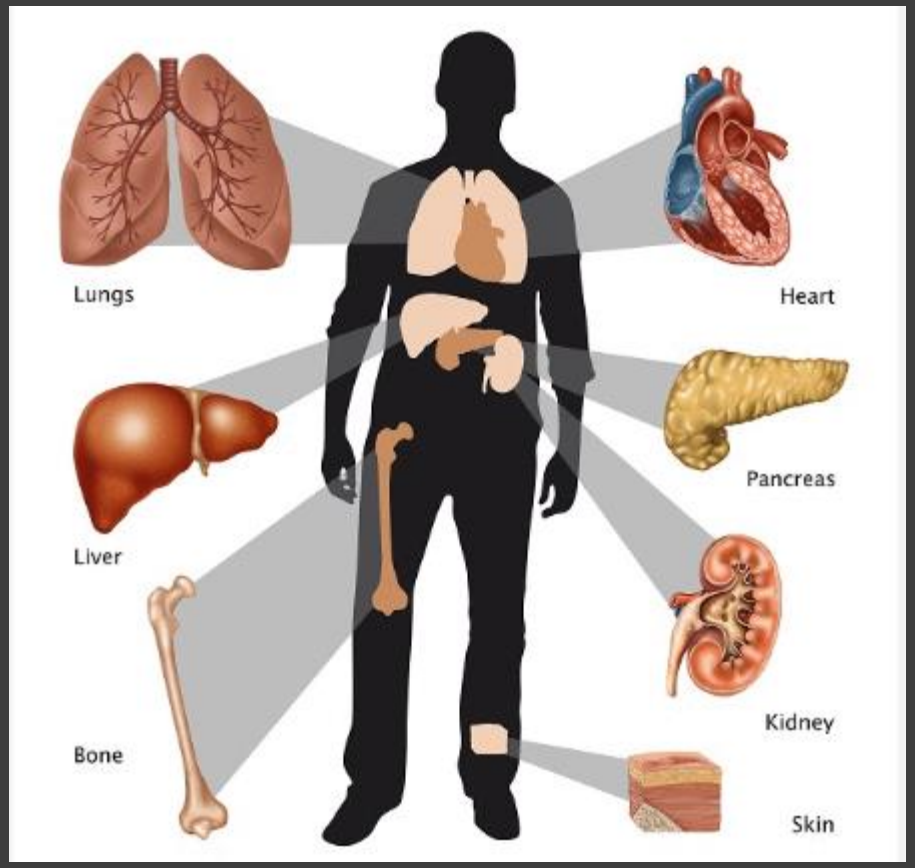
- *Let's Talk About "It": Sexual Health after Solid Organ Transplant* with Christina Doligalski, PharmD, BCPS, CPP, FAST, FCCP

NOW WHAT DO I EAT: NUTRITION FOR LIFE AFTER TRANSPLANT

JODI METTEL, MS, RD, LDN, CCTD

UNC LUNG AND HEART TRANSPLANT & LVAD DIETITIAN

MANAGING DIABETES



Uncontrolled blood sugars can lead to:

- Kidney failure
- Organ rejection
- Vision issues
- Nerve problems
- Non-healing wounds
- Digestive issues

Ways to control blood sugars

- Taking your medications as prescribed
- Avoiding sugary beverages
- Limiting sweets
- Eating balanced meals

Taking your medications as prescribed

- Do not skip doses of medications
- Contact the team if you are noticing high or low blood sugars

Avoiding sugary beverages

- Soda
- Juice
- Tea
- Lemonade
- Fruit Punch
- Sports Drinks
- Energy Drinks

Apple Juice

Nutrition Facts

8 servings per container

Serving size 8 fl oz (240 mL)

Amount Per Serving

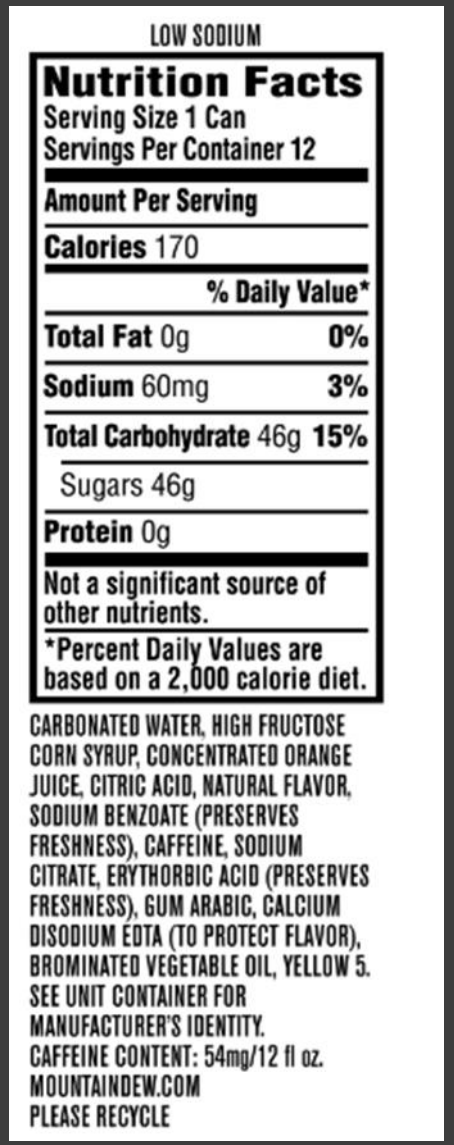
Calories 120

	% Daily Value*
Total Fat 0g	0%
Saturated Fat 0g	0%
Trans Fat 0g	
Cholesterol 0mg	0%
Sodium 15mg	0%
Total Carbohydrate 28g	10%
Dietary Fiber 0g	0%
Total Sugars 26g	
Includes 0g Added Sugars	0%
Protein 0g	0%
Vitamin D 0mcg	0%
Calcium 0mg	0%
Iron 0mg	0%
Potassium 260mg	6%

*The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.

INGREDIENTS: WATER, APPLE JUICE CONCENTRATE, MALIC ACID.

Mountain Dew



LOW SODIUM

Nutrition Facts

Serving Size 1 Can
Servings Per Container 12

Amount Per Serving

Calories 170

	% Daily Value*
Total Fat 0g	0%
Sodium 60mg	3%
Total Carbohydrate 46g	15%
Sugars 46g	
Protein 0g	

Not a significant source of other nutrients.

***Percent Daily Values are based on a 2,000 calorie diet.**

CARBONATED WATER, HIGH FRUCTOSE CORN SYRUP, CONCENTRATED ORANGE JUICE, CITRIC ACID, NATURAL FLAVOR, SODIUM BENZOATE (PRESERVES FRESHNESS), CAFFEINE, SODIUM CITRATE, ERYTHORBIC ACID (PRESERVES FRESHNESS), GUM ARABIC, CALCIUM DISODIUM EDTA (TO PROTECT FLAVOR), BROMINATED VEGETABLE OIL, YELLOW 5.
SEE UNIT CONTAINER FOR MANUFACTURER'S IDENTITY.
CAFFEINE CONTENT: 54mg/12 fl oz.
MOUNTAINDEW.COM
PLEASE RECYCLE

Tropicana Zero Sugar

3% JUICE

Nutrition Facts

About 6 servings per container

Serving size 8 fl oz (240 mL)

Amount per serving

Calories 5

	% Daily Value
Total Fat 0g	0%
Sodium 25mg	1%
Total Carbohydrate <1g	0%
Total Sugars 0g	
Includes 0g Added Sugars	0%
Protein 0g	
Potassium 135mg	2%
Vitamin C 90mg	100%

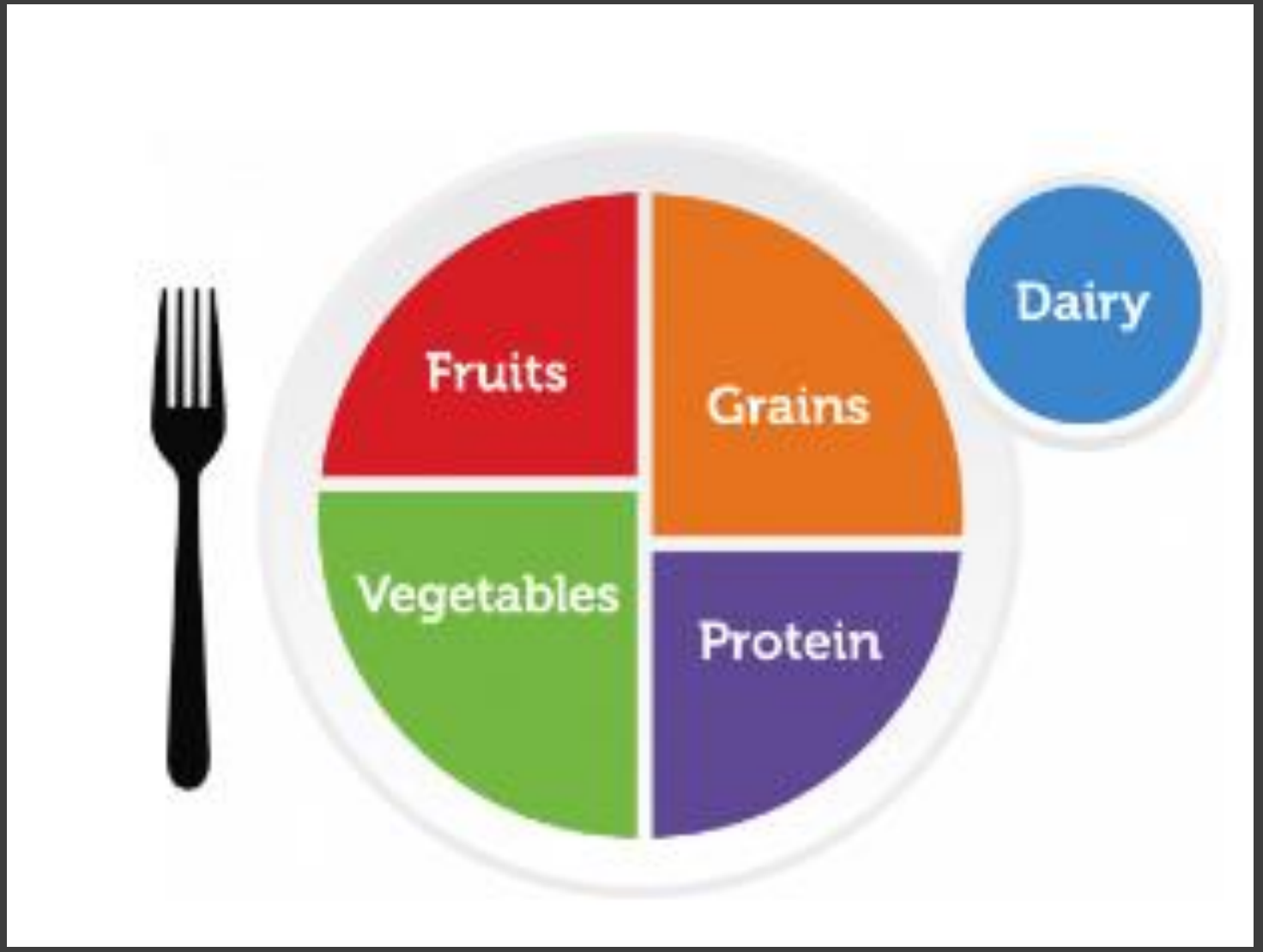
Not a significant source of saturated fat, *trans* fat, cholesterol, dietary fiber, vitamin D, calcium, and iron.

Ingredients: Water, lemon juice concentrate*, citric acid, potassium citrate, natural flavor, ascorbic acid (vitamin C), peach puree concentrate*, cherry juice concentrate*, red grape juice concentrate*, clarified pineapple juice concentrate* and steviol glycosides.
*Adds a negligible amount of sugar

Limiting Sweets

- Cakes
- Cookies
- Candy
- Pies
- Canned fruit in heavy syrup
- Snack cakes
- Pudding

Eating Balanced Meals



https://www.myplate.gov/eat-healthy/what-is-myplate

Macronutrients & Micronutrients

- Macronutrients
  - Fat
  - Protein
  - Carbohydrates
- Micronutrients
  - Vitamins
  - Minerals

There are no bad foods –

Occasionally (good)

Sometimes (better)

Often (best)

Fat

- Four major dietary fats in food
  - “Bad”
    - Saturated fats
    - Trans fats
  - “Good”
    - Monounsaturated fats
    - Polyunsaturated fats

Fat

- Slower rate of digestion
- Decreases absorption of sugar
- Keeps us fuller longer
- Calorically dense
- Helps our bodies absorb important vitamins – A, D, E, K

Saturated Fat

- Occur naturally in many foods
- Most come from animal sources
  - Meat
  - Dairy products
- Tropical fats
  - Coconut
  - Palm
  - Palm kernel
- Takeaway – can be part of a healthy, balanced diet

Trans Fat

- Easy to use
- Inexpensive to produce
- Last a long time
  - Oils can be reused
- Give foods a desirable taste and texture

Monounsaturated Fat

- Can help reduce LDL cholesterol
- Provide nutrients to help develop and maintain cells in your body
- Examples:
  - Oils – olive, canola, peanut, safflower, sesame
  - Foods – avocado, peanut butter, almonds, hazelnuts, pecans, pumpkin seeds, sesame seeds

Polyunsaturated Fat

- Can help reduce LDL cholesterol
- Help develop and maintain cells in your body
- Provides Omega-3 and Omega-6 fatty acids
- Examples:
  - Oils – canola, corn, soybean, sunflower
  - Foods – fish, walnuts, flaxseeds, sunflower seeds, tofu, soybeans

Protein

- Building block of muscle, tissue and organs
- Can help you feel full
- Can help control blood glucose levels
- Can help maintain bone mass (lowering risk of osteoporosis)
- Can boost metabolism
- Helps you heal
- Can help prevent age-related muscle losses

Protein Sources

- Lean or low-fat meat and poultry – chicken, turkey, beef, pork, lamb, bison, venison
- Fish and shellfish – cod, tilapia, trout, flounder, salmon, tuna, shrimp, oysters, clams, mussels, scallops
- Eggs

Protein Sources

- Lightly salted or unsalted nuts – walnuts, pistachios, almonds, cashews
- Seeds – sunflower, pumpkin, flax, chia
- Beans, peas and lentils – edamame, black beans, pinto beans, chickpeas, lima beans
- Soy products – tofu, tempeh

Protein Sources

- Dairy products –milk, cottage cheese, yogurt (Greek), cheese (not American)
- Plant-based products made from soy or with added protein – soy milk, soy yogurt, pea milk, almond, coconut or oat milk with added protein
- Whole grains – oats, quinoa, farro

Carbohydrates

- Types of carbohydrates:
  - Sugar
  - Fiber
  - Starch
- All carbohydrates break down into sugar
- Simple vs Complex Carbohydrates

Simple vs Complex Carbohydrates

- Simple carbohydrates
  - Digest quickly
  - Cause blood sugar spikes
  - Can contribute to weight gain
  - Can increase risk for diabetes and heart disease
- Complex carbohydrates
  - Takes longer to break down
  - Less likely to cause spikes in blood sugars
  - Also contain other nutrients

Sugar

- Quickly absorbed carbohydrates
- Useful to raise blood sugars when they are low
- Two types:
  - Naturally occurring – milk (lactose) and fresh fruit
  - Added – sweets, canned fruit, juice, soda
- Common names:

Cane sugar	Sucrose
Maple syrup	Glucose
Corn syrup	Honey
Dextrose	Molasses
Fructose	Sugar

Fiber

- Type of carbohydrate the body can't break down very well

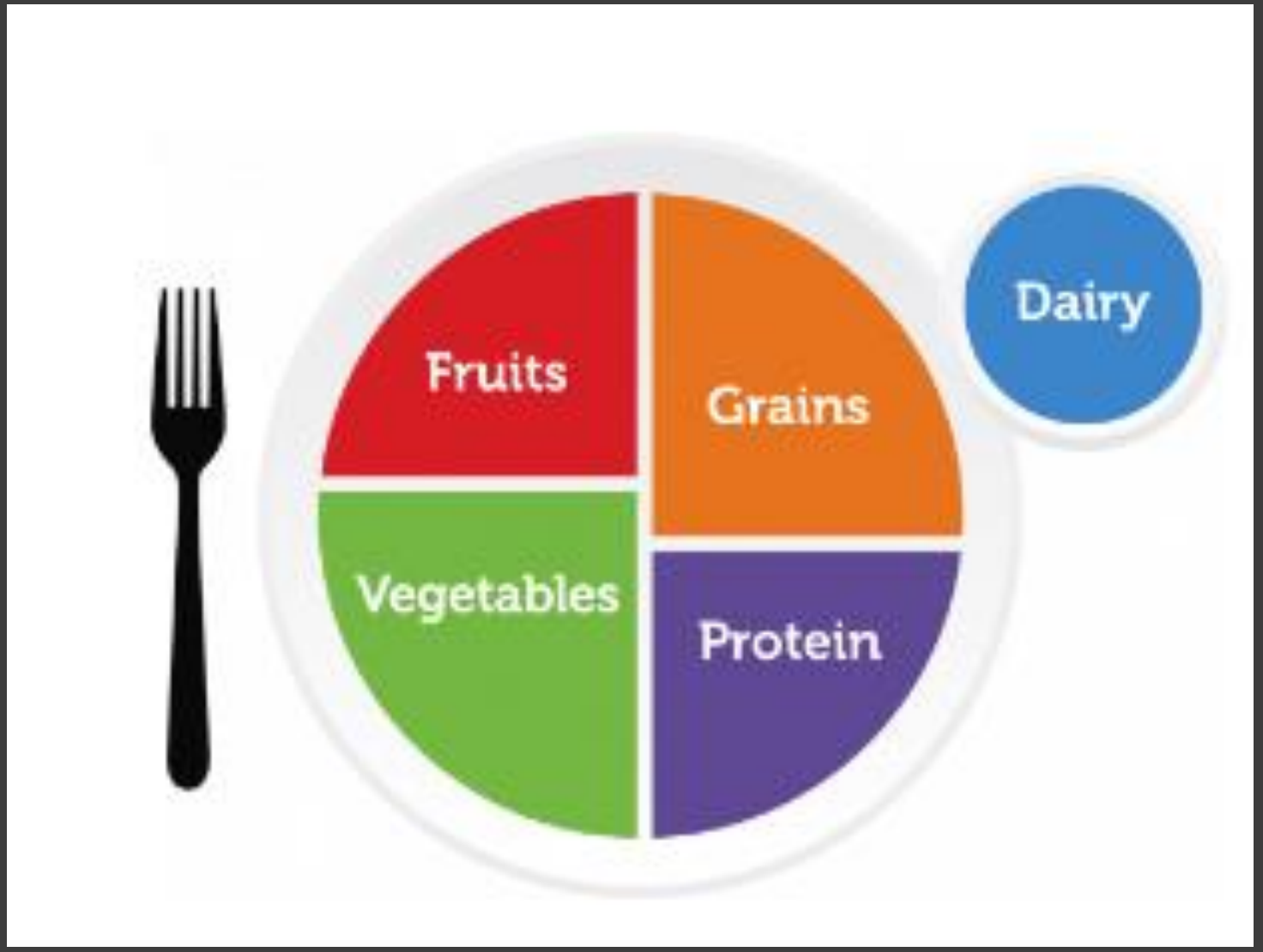
- Benefits
  - Normalizes bowel movements
  - Maintains bowel health
  - Lowers cholesterol
  - Helps control blood sugars
  - Can aid in achieving a healthy weight
  - May help you live longer

- Two types:
  - **Soluble** – oats, peas, beans, apples, citrus fruits, carrots, barley and psyllium
  - **Insoluble** – whole wheat flour, wheat bran, nuts, beans, corn, cauliflower

Starch

- Takes longer for body to break them down
- Aids in blood glucose regulation
- Can keep you full longer
- Foods
  - Beans and Legumes
  - Fruits
  - Whole-grains
  - Vegetables

Eating Balanced Meals



https://www.myplate.gov/eat-healthy/what-is-myplate

There are no bad foods –

Occasionally (good)

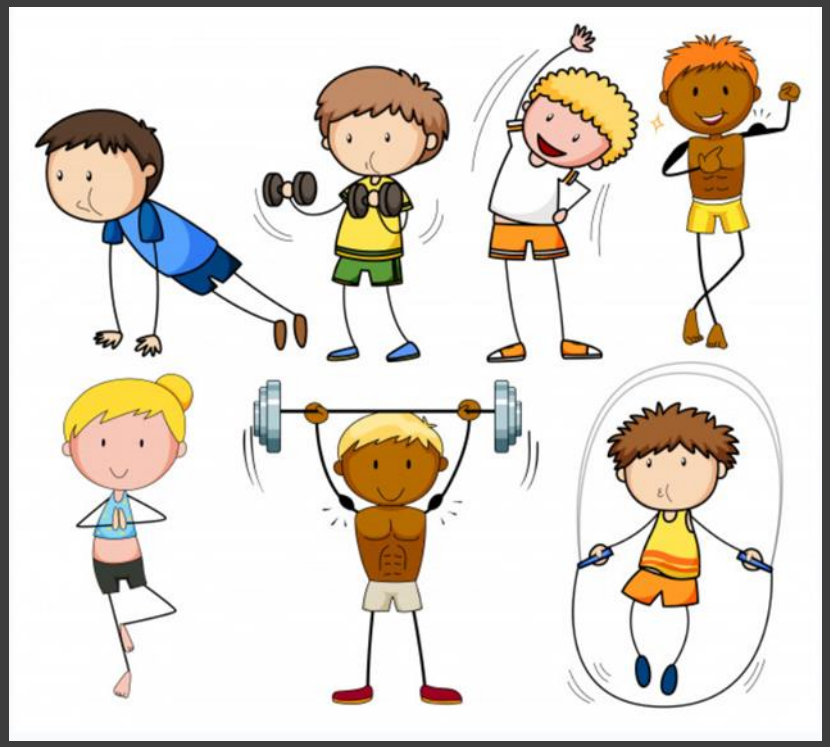
Sometimes (better)

Often (best)

Sodium

- Body balances sodium and water
  - Eating a lot of sodium can cause water retention
    - Raises blood pressure
    - Heart work harder
- Salt substitutes - replace sodium with potassium
- Types of salt
  - Vary based on where they are mined from and their mineral composition
- 1 teaspoon of table salt has ~2300 mg sodium

Exercise



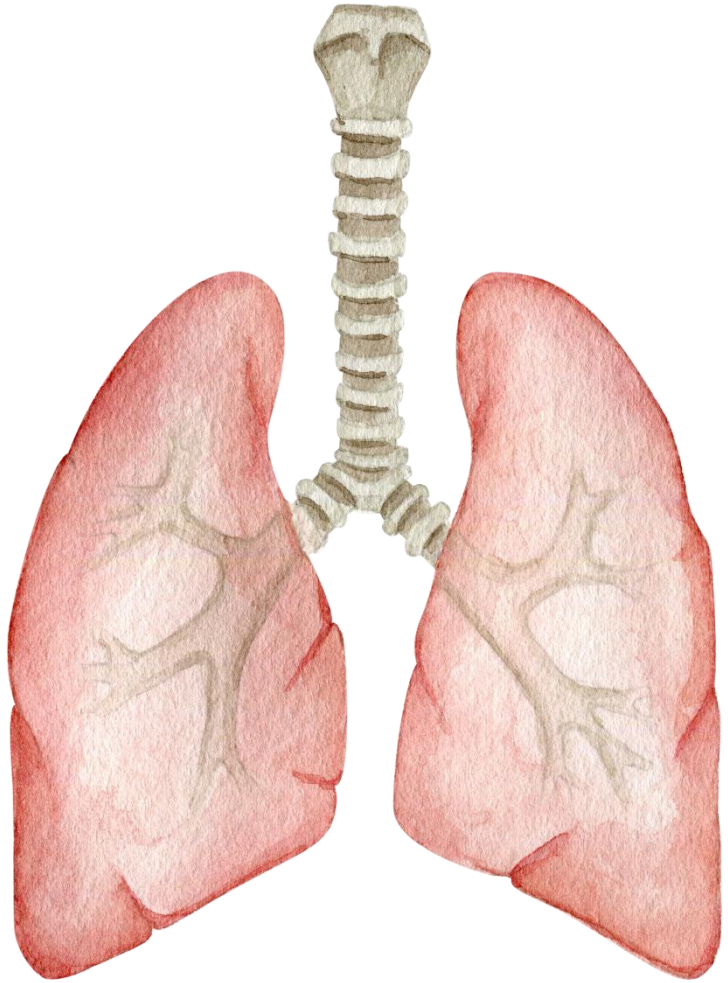
- Increases HDL cholesterol
- Lowers blood glucose levels
- Recommendation
  - 150 minutes per week of moderate intensity exercise
    - Heart beats a little faster
    - Breathing a bit harder
- Move more
  - Any increase in movement is beneficial
    - Take the stairs instead of the elevator
    - Park your car further away
    - If sitting a lot for work set an alarm every hour to remind you to get up and move
- Resistance training
  - Minimum twice weekly

Summary

- There are no bad foods just foods that shouldn't be eaten as frequently
- Protein is a very important part of our diet
- We should choose carbohydrates that contain fiber and help manage our blood sugars
- The best diet is a balanced one combining all macronutrients
- Controlling blood sugars is important
- Limiting the amount of salt can help prevent fluid retention and help blood pressure
- Exercise is another important piece of living the rest of your life

Did You Know?

UNC Center for Transplant Care performed 11 Lung Transplants in 2023 and has performed over 500 lung transplants since 1990.



Let's Talk About "It": Sexual Health after Solid Organ Transplant

Christina Teeter Doligalski, PharmD, BCPS, CPP, FAST, FCCP
Clinical Pharmacist Practitioner, Solid Organ Transplant Clinics
Director, PGY2 Solid Organ Transplant Pharmacy Residency
Assistant Professor of Clinical Education, UNC Eshelman School of Pharmacy
UNC Hospitals and Clinics

Roadmap

- Sexual activity after transplant
- Contraception
- Complications with sexual function
- Pregnancy
- Menopause

Sexual Activity after Transplant

Why did you get a transplant?

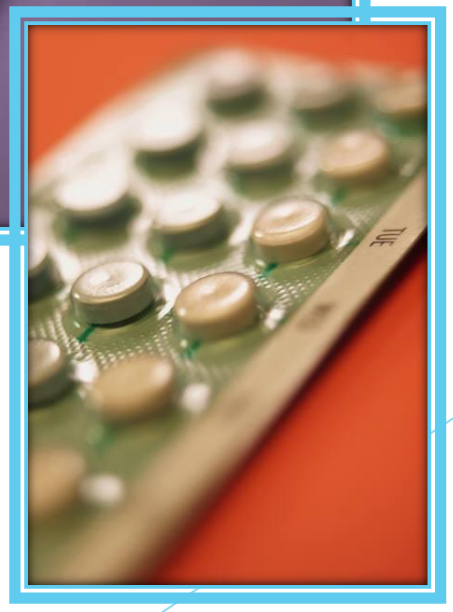
To live – and live FULLY!

Sexual Activity after Transplant

- When can I have sex?
- What can (and can I not) do?
  - Will that change?
  - When will it change?
  - How will I know when I'm ready?

- Bottom Line: These are important questions that you should ask if you haven't been told! Remember why you went through this marathon of a process.

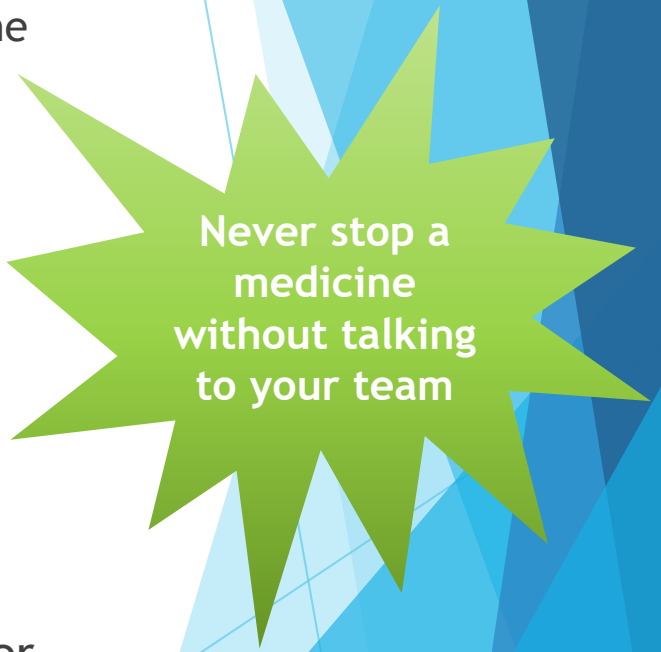
Contraception



Fertility in Male Transplant Recipients

- End stage organ disease often causes decreased sperm counts
  - In one small study, only 20% of males aged 20-50 had normal sperm counts at the time of kidney transplant
- Following successful transplant, sperm counts often return to normal
- Some medicines may affect sperm count – this is reversed after medicines stopped
  - Sirolimus (Rapamune®)
  - Everolimus (Zortress®)
  - Valganciclovir (Valcyte®)

- Bottom Line: until proven otherwise, you should expect you are fertile after transplant; if you are hoping to father children and having infertility challenges, talk to your transplant team about medicines that may be contributing to make a plan specific to you



Fertility in Female Transplant Recipients

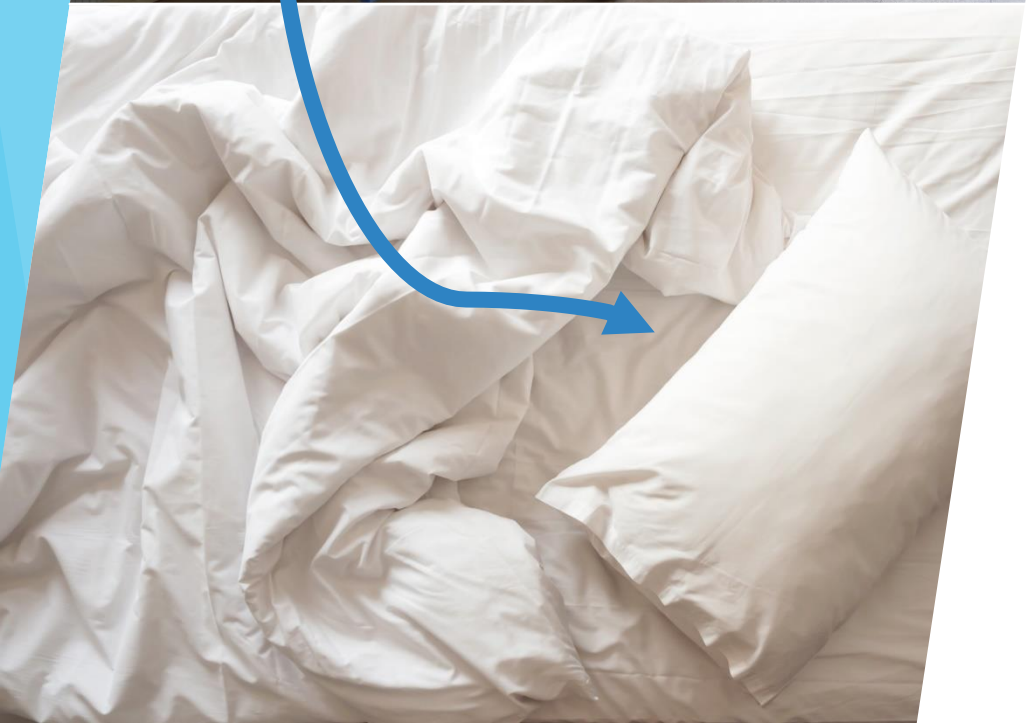
- End stage organ disease often leads to variation or cessation of menses in females
  - 94% of females on dialysis have no menses
- Following successful transplant, ovulation rapidly returns
  - Kidney transplant: ~5 months
    - Regular menstrual cycle: ~7 months
  - Liver transplant: ~8 months

"I can't get pregnant"

Contraceptive	Efficacy	Advantages	Disadvantages
Abstinence, fertility awareness methods	76%	No hormones or side effects, free	Very poor efficacy
Spermicide and Gel	79%	Female-driven utilization, no hormones	Poor efficacy
Female Condom, Diaphragm, Cervical cap	79%	Female-driven utilization, no hormones	Availability, fitting, poor efficacy
Male Condom	87%	Widespread availability, no hormones, prevents STIs	Efficacy, technique important
Mini-Pill (progrestin-only pill)	90%	No drug interactions or blood clot risks	Strict timing CRITICAL
Birth Control Pills (estrogen and progestin)	93%	Widest variety of options	Drug interactions and blood clot risks
Birth Control Patch	93%	Weekly placement	Drug interactions and blood clot risks
Vaginal Ring (NuvaRing®)	93%	Monthly placement	Drug interactions, blood clot risks, infection risk
Injection (Depo-Provera®)	96%	Injection at a doctor's office every 3 months	Irregular bleeding, bone loss
Implant (Nexplanon®)	>99%	Lasts 5 years, no drug interactions or blood clot risks	Must be placed in a clinic
IUD (Mirena®, Kylena®)	>99%	Lasts 5-7 years, no drug interactions or blood clot risks	Must be placed in a clinic
Sterilization	>99.5%	Most effective, longest lasting	Irreversible, requires surgery

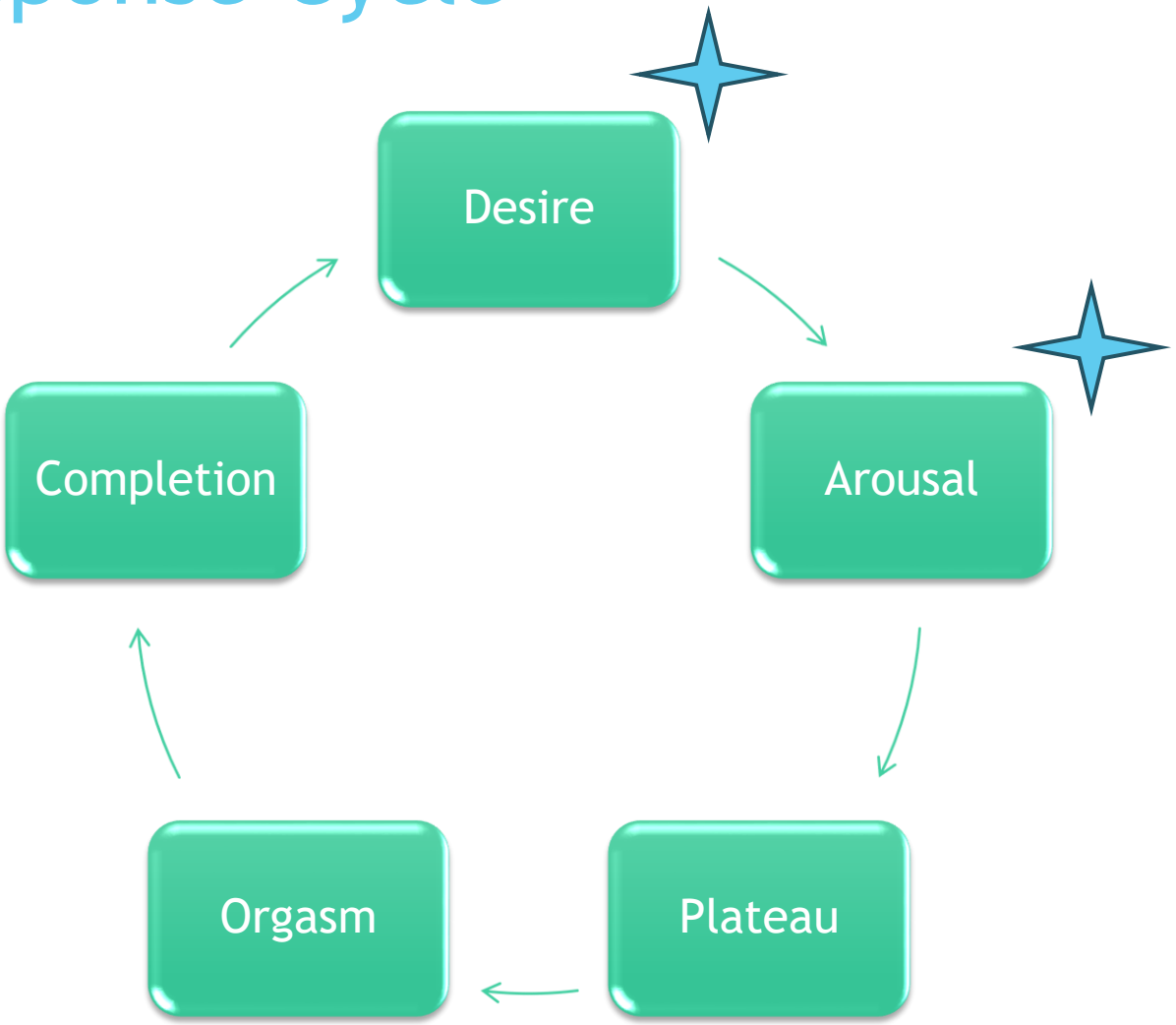
Contraception Take Homes

- Pregnancy is ABSOLUTELY, physically possible after transplant
- There is no one-size-fits-all answer to the best contraceptive
- Talk to your transplant team about the best option for you



Complications with Sexual Function

Sexual Response Cycle

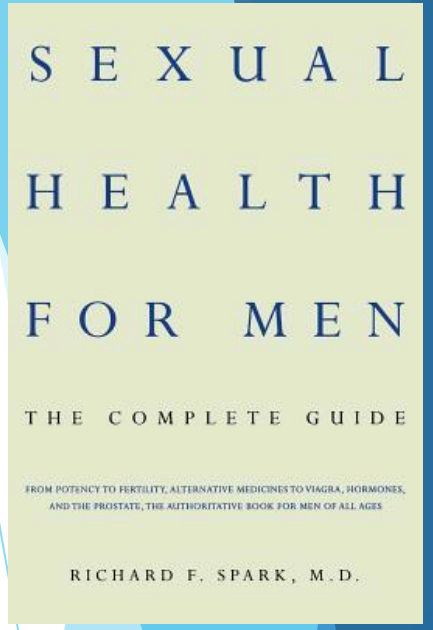


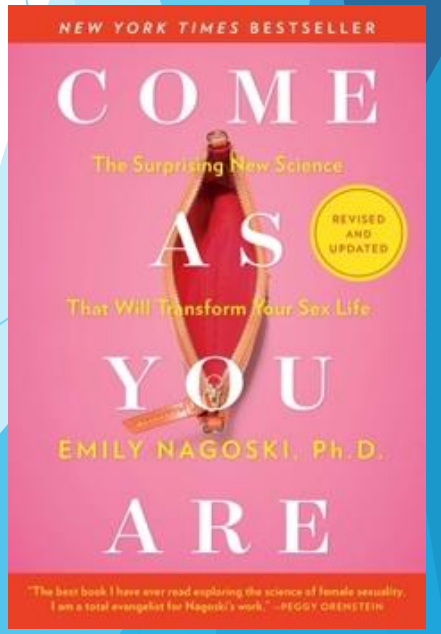
“There is nothing that stands in the way more to a [woman’s] desire than the sense of caretaking.”

- Esther Perel, on women’s sexual health following childbirth

Strategies to Optimize Sexual Function in Chronic Illness

- Environmental strategies
  - Plan sexual activities when your symptoms are at their lowest and energy is at its highest
  - Experiment with different positions and pillows to optimize comfort
- Psychological strategies
  - Communicate likes, dislikes and needs with your partner(s)
  - Maximize use of non-sexual intimate touch
  - Use self help books that cover sexual health and illness/sexual wellbeing
  - Use self-stimulation to reduce anxiety and help with sleep
  - Cognitive behavioral therapy may be helpful





Strategies to Optimize Sexual Function in Chronic Illness

- Dietary strategies
  - Avoid tobacco, alcohol, and sexual activity within a few hours of eating
- Medication strategies
  - Talk to your team about medicines that may be affecting your sexual function and minimize as much as possible
  - Talk to your team about medicines that may help sexual function (eg, sildenafil, (Viagra®))

Pregnancy

Pregnancy after Transplant

Recommendations for pregnancy avoidance

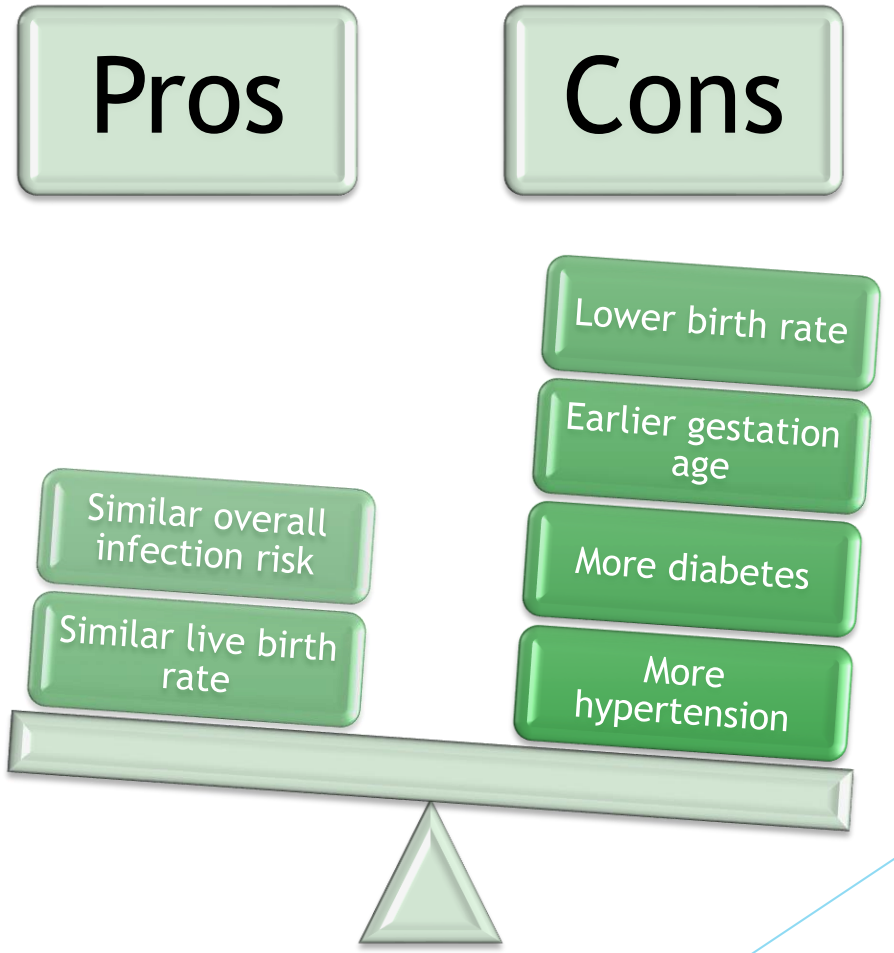
- First post-transplant year in all patients
- Unstable graft function
- High risk of rejection
- High risk of infection
- Mycophenolate use

Recommendations for safe timing of pregnancy

- > 1 year post-transplant
- Stable graft function
- No recent rejection or infection episodes
- Controlled blood pressure
- Low risk for rejection/infection
- Optimized pre-pregnancy immunosuppression
- Routine, stable follow up with multidisciplinary care team

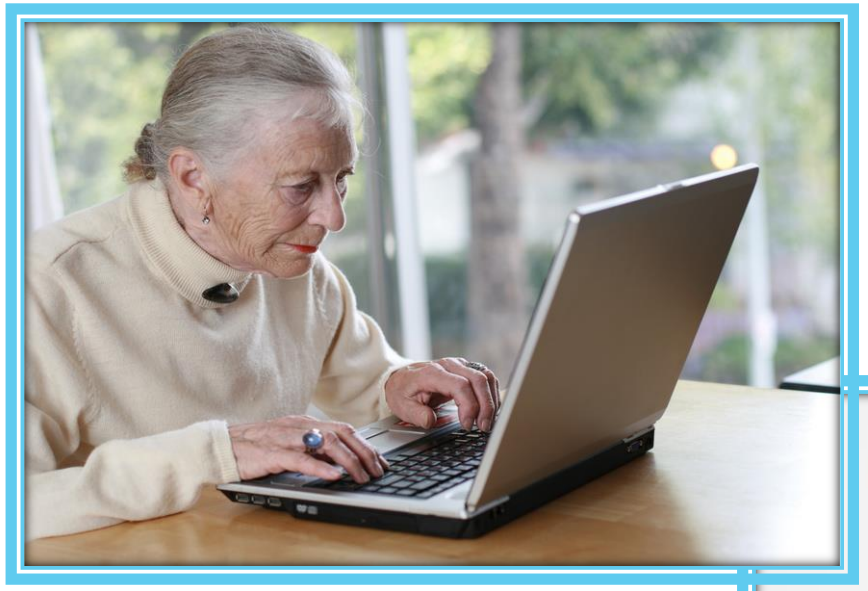
Outcomes of Pregnancy in Transplant Recipients

- All our data about pregnancy following transplant is from registries
- TPRI has collected data on over 2500 pregnancies
- Rejection during pregnancy is a BIG risk factor for graft loss following pregnancy (3 – 10 fold risk increase)



Pregnancy Affects Everything

- Every organ system is affected by pregnancy
  - Heart
  - Lungs
  - Liver
  - Kidney
  - Stomach/Intestines
- Every transplant medicine is affected by pregnancy



Menopause

Menopause

- Average age of menopause in the United States is 51
- Peri-menopause (time around menopause) can last 2 – 8 years

Vasomotor Symptoms

- Hot flashes
- Sleep problems
- Night sweats
- Mood changes
- Brain fog

Genitourinary Symptoms

- Vaginal dryness
- Painful intercourse
- Irregular periods
- Increased urinary tract infections

Medicines for Menopause

- Hormone replacement
  - Hormone pills and patches may interact with medicines or increase your risk of blood clots → ask your transplant team if they are safe for you
    - If you have a uterus, you should always use
  - Compounded or non-prescription hormones have the same risk
  - Vaginal hormone creams are generally safe and can help with genitourinary symptoms
- Some medicines (eg: venlafaxine (Effexor®), fezolinetant (Veozah®)) can help with hot flashes and night sweats
- Don't forget your bones – osteoporosis (bone loss) is very common in menopause
- Talk to your team about your symptoms!

Questions?

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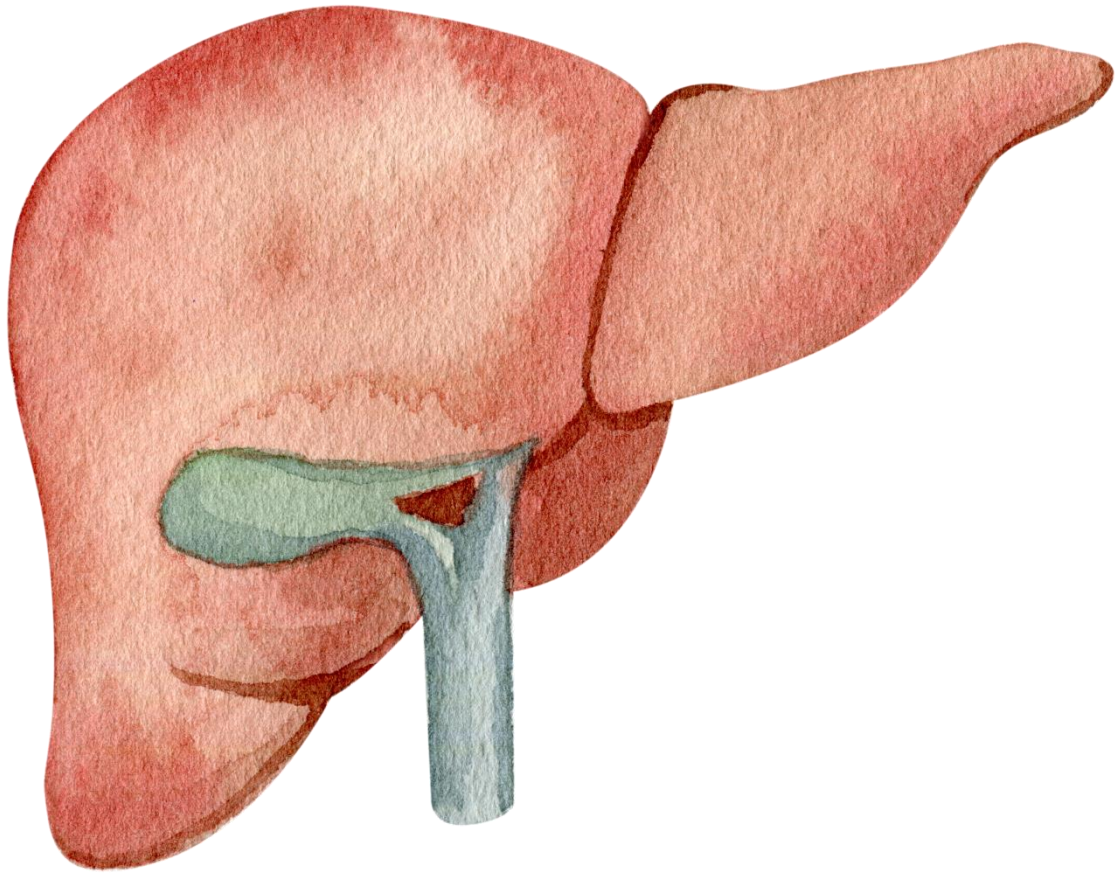
SNACK BREAK 2:30 – 2:50PM

Did You Know?

UNC Center for Transplant Care performed 40 Liver Transplants in 2023. We also started a Living Liver Donor Program!



Emotional Resiliency and Transplant

Eileen Burker, Ph.D.
Departments of Health Sciences & Psychiatry
UNC Heart Transplant, Lung Transplant & LVAD programs
University of North Carolina at Chapel Hill

Life with transplant can involve ups and downs! Research shows that transplant patients and their caregivers report higher levels of stress than other patient populations.

Managing the up and downs requires resilience.

Transplant patients with higher levels of resilience have lower psychological distress and better physical outcomes.

(Stonnington, et al., 2016)

So what is resilience?

Emotional Resiliency

The term was first introduced by Michael Rutter in 1987.

He defined resilience as **the different ways that individuals can respond healthily and positively to difficult experiences and stressful situations.**

Emotional Resiliency

Professor Emmy Werner, a Child Psychologist, was also among the first to use the term **emotional resilience** in 1992.

She defined resilience as **the ability of children to continue developing and achieving success, even when faced with *trauma, stress, or difficult life circumstances.***

What is Emotional Resilience?

The American Psychological Association says emotional resilience is:

“**successfully adapting to difficult or challenging life experiences, through mental, emotional, and behavioral flexibility and adjustment to external and internal demands**”

Resilience is your ability to adapt and respond in healthy ways (behaviorally, emotionally, and cognitively) to hardships and challenges.

What is Emotional Resilience?

Other definitions:

- The ability to effectively cope with stress and tough life events
- Healthy, adaptive, positive functioning over time after experiencing adversity.
- Maintaining normal or positive functioning despite negative events or emotions.
- The capacity to adapt to or cope with adversity.

Resilience in Transplant Candidates, Recipients, Family Members & Caregivers

Transplantation is a significant life event that can be very stressful, can impact your mental health, and can impact your quality of life.

- **Pre-transplant stressors** include learning about transplant, meeting the team, worrying about your health and then of course, ***WAITING!***
- **Post-transplant stressors** include learning and managing complicated medication regimens, monitoring for signs of rejection or infection, and uncertainty.
- Being resilient and being able to cope with these challenges is important for well-being.

Resilience in Transplant Candidates, Recipients, Family Members & Caregivers

Today we'll talk about:

-What things decrease your resilience

-What things increase your resilience

-What the research shows about resilience in transplant

-What things you can do to boost your resilience

What Decreases your Resiliency?

Emotional resiliency can **decrease** due to:

- **Consistent stress**- makes it difficult to respond to negative situations with resilience, and can lead to burnout.
- **Lack of social support**- when you have minimal emotional, practical, or social support, it can affect recovery and well-being.
- **Negative feelings**- anxiety, anger, fear and helplessness can decrease resilience over time.

What Decreases your Resiliency?

Emotional resiliency can **decrease** due to:

- **Financial problems**- not being able to work due to being sick.
- **Social exclusion**- when someone avoids you or intentionally does not spend time with you, or vice versa!
- **Poor coping skills**- when you use coping skills that are not helpful (coping via alcohol, smoking, or disengaging) your resilience can decrease.

What Strengthens your Emotional Resilience?

Many things are associated with high emotional resiliency.

- **Strong ability to cope with & regulate emotions**- when you have skills to manage your emotions in difficult situations (using deep breathing to stay calm after receiving bad news).

- **Healthy lifestyle**- engaging in activities that promote physical and mental well-being (exercise, a balanced diet).

What Strengthens Emotional Resiliency?

- **High self-esteem**- when someone has a positive view of themselves (feeling proud of yourself after a procedure).
- **Good social supports**- having a network of supportive relationships (friends and family are there for you during tough times)

What Strengthens Emotional Resiliency?

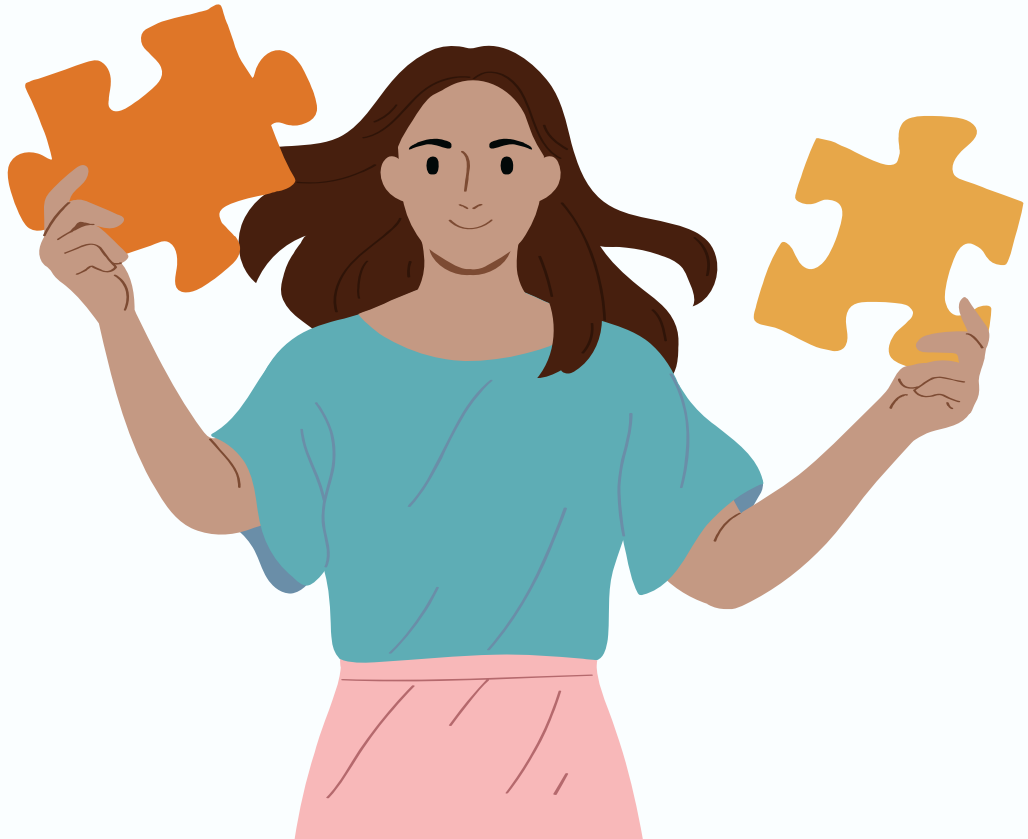
- **Spirituality**- having a connection to something greater than yourself (religion or a personal belief).
- **Self-efficacy**- when you believe you can handle challenges (feeling confident that you can manage yur medications).
- **Hardness and grit**- being persistent about overcoming tough times (continuing to work towards a personal goal during a tough time).

What Strengthens Emotional Resiliency?

- **Adaptability**- when you can adjust to new situations (being flexible about a change at the hospital).
- **Optimism**- having a positive outlook (believing that whatever hardship you're facing will improve in the future).

Emotional Resiliency and Transplant…

…what does the research show?



Resiliency and Heart Transplant

A study was conducted at a hospital on **the role of resiliency in the process of adapting to life after heart transplant.**

53 heart transplant recipients who were between 4 months and 18 years post-transplant completed a survey about **different aspects of resilience. They looked at…**

- persistence and determination
- openness to new experiences and humor
- personal coping skills and tolerance for negative emotions
- tolerance for failure and viewing life as a challenge,
- optimism and self-motivation in difficult situations.

Baran, A. (2013)

Resiliency and Heart Transplant: Results

Recipients had adjusted well to living with a transplanted heart.

Patients who had high levels of resiliency:

- used functional coping skills
- were able to handle negative feelings
- embraced new experiences
- saw life as a challenge

★ Fostering resilience can **significantly improve adaptation after heart transplantation.**

Baran, A. (2013)

Resiliency and Kidney Transplant

A study **to assess the connection between resilience and psychological distress in 139 renal transplant recipients** was carried out at renal transplant clinics across three general hospitals.

Tian, X. et al., (2016)

Resiliency and Kidney Transplant

42% of participants showed signs of psychological distress, but for every **one-point increase in resiliency there was a decrease in distress.**

Hope, tolerating negative emotions and strong self-reflection were associated with decreased stress, improved coping, and sped up recovery.

Resilience is linked to lower anxiety, depression, burnout, and post-traumatic stress disorder **in patients with a kidney transplant.**

Interventions that improve resilience can reduce distress in kidney transplant recipients.

Tian, X. et al., (2016)

Resiliency and Liver Transplant

A study examined how **resilience relates to quality of life, social support, depression, anxiety, age, cognitive ability, and disease severity.**

Participants were 18 years or older on the waitlist for liver transplant

- **Higher scores on a Resiliency Scale were linked to better social support and quality of life, and lower levels of depression and anxiety.**

Fernandez, A.C. et al., (2015)

They found these traits may increase resiliency:

- Viewing change or stress as an opportunity
- Feeling in-control
- Having meaningful relationships
- Self-assurance
- Strong problem-solving skills
- Sense of humor
- Optimism
- Functional coping with negative emotions

Fernandez, A.C. et al., (2015)

Resiliency and Lung Transplants

A study examined **how resilience affected outcomes for lung transplant candidates.** Participants were adults on the waiting list for lung or heart-lung transplants.

One in six lung candidates had low resilience, and those folks struggled more with the stress and challenges of waiting.

Bui, Y.T. et al., (2020)

Resiliency and Lung Transplants Cont.

- **Low resiliency** was linked to **a higher risk of either dying or being removed from the transplant list** before they could get the surgery.

★ **Resilience plays a crucial role in overall well-being for lung transplant candidates** facing the stress of waiting and undergoing surgery.

★ **Improving resilience is definitely possible through interventions……**

Bui, Y.T. et al., (2020)

So How Do We Develop or Improve Resiliency?

Developing Resiliency

Resilience is something that we can build over time through practice.

It is a skill that requires ongoing effort to develop and strengthen.

Protective factors play an important role in this process. They help people handle stress and protect their well-being. Protective factors can be internal or external.

Developing Resiliency: Protective Factors

Internal factors include: spirituality (destiny, beliefs), hope (future dreams), staying active (keeping busy, exercising), and maintaining a positive outlook (being optimistic about the future).

External factors include: social support (family and friends), strong family ties (having a good relationship with your family), and making healthy lifestyle choices (healthy diet, drinking water).

Any combination of these factors can help protect individuals from the negative effects of challenging situations and support their overall resilience.

Improving Resiliency

In addition to protective factors we may already have, we can **learn** things to improve our resiliency…

Evidenced Based Practices for Increasing Emotional Resiliency

Stress Management:

- Involves slowly **getting used to stress in a safe environment to help reduce its impact over time.**

Reward Enhancement:

- Strengthens the brain areas that are linked to positive rewards **to help prevent the effects of stress.**

Practical Strategies:

- Includes techniques such as **developing optimism (having a positive outlook/ anticipating good outcomes), social connectiveness (having a network of supportive friends and family), mindfulness (deep breathing, journaling), and religious activities**.

Evidenced Based Practices for Increasing Emotional Resiliency

Gradual Exposure: Introducing individuals to stressful situations in a safe manner **to lessen their fear and stress.**

- Let patients learn about the transplant process at their own pace; meet their healthcare providers in a safe environment to reduce anxiety.

Proactive Stress Management: Taking steps to **manage stress exposure without completely avoiding it.**

- Encourage patients to have a plan on how they will handle stress during recovery (scheduling regular follow-ups, journaling).

Active Coping: Encouraging individuals to **confront challenges**, and to **be proactive about preventing negative outcomes** instead of passive.

- Motivate patients to take charge of their recovery by setting health-related goals (following a medication schedule, going to a rehabilitation program).

Evidenced Based Practices for Increasing Emotional Resiliency

Controlled Exposure:

- Handling parts of stressful situations to **make them more manageable**.
    - Patients are introduced to the transplant environment little by little for non-medical appointments; patients have the opportunity to meet the transplant team and tour the facility to reduce anxiety.

Skill Practice:

- **Using and refining new coping skills** in lower-stress situations.
    - Patients practice coping skills during doctor visits, such as deep breathing and mindfulness which can build resilience over time.

Well-Being Activities:

- Engaging in practices that **enhance overall well-being**.
    - Proper sleep, exercise, gratitude (being appreciative for what you have), emotional regulation (controlling emotions in a healthy way, like through breathing techniques), and mindfulness (focusing on what is happening in the moment *and* being aware of how you think and feel about it).

Evidenced Based Practices for Increasing Emotional Resiliency: CBT + Mindfulness

Cognitive Behavioral Therapy (CBT) helps people **understand how their thoughts, feelings, and actions affect each other.** It can **change negative thinking patterns** and **improve how you cope with challenges**.

- Journaling: track how you are feeling and challenge negative thoughts by replacing them with positive ones.

Mindfulness involves focusing on the present moment and **being aware of one's thoughts, feelings, and surroundings without judgment.** It can help you **manage stress** and improve emotional awareness.

- Breathing exercises: practice deep breathing to stay calm during a tough moment; pay attention to any sensations that you feel.

Evidenced Based Practices for Increasing Emotional Resiliency

CBT + Mindfulness

Using both CBT and mindfulness together **helps individuals change negative thoughts and behaviors while also being more aware and accepting of their current experiences**.

This combined method supports better emotional regulation and coping.

A Study to Increase Resilience in Transplant Pts and their Caregivers

31 heart, liver, kidney/pancreas patients and 18 caregivers participated in a 6-week mindfulness-based resilience training group.

In the 6 groups, people learned mindfulness, strategies for improving resilience, learned to improve attention and enhance compassion, gratitude, acceptance, meaning and purpose and talked about forgiveness.

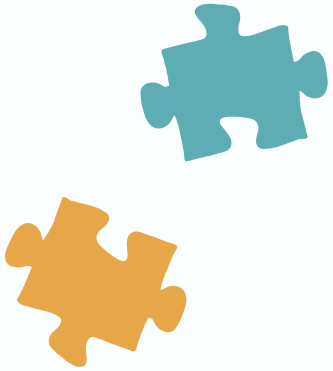
At the 6-week mark *and again* 3 months after the program ended, patients had significant improvement in perceived stress, depression, anxiety, quality of life and positive affect.

(Stonnington, et al., 2016)

Summary

- Resilience plays a key role in managing the stress and challenges of transplant.
- For patients, resilience can **improve recovery outcomes, adherence to treatment, and increase optimism about the future.**
- For caregivers, resilience **supports self-care methods** and helps to **manage the demands of supporting someone who is undergoing the transplant process.**
- Building resilience is possible andcan enhance quality of life for patients and caregivers, making the transplant experience more manageable and successful.

Questions/Comments?



Thank You!

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